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NOTICE TO AUTHORS

Before submitting manuscripts for publication authors should consult Information for Contributors to the Journal of Speech and Hearing Disorders, *JSHD*, 14, 1949, 93-94. Prospective authors are invited to write the Editor for copies of this Note, and of its supplement, Examples of Manuscript Form.

TWENTY-SEVENTH ANNUAL CONVENTION

December 27-29, Stevens Hotel, Chicago

AMERICAN SPEECH AND HEARING ASSOCIATION

CONTRIBUTORS to the 1951 Convention program are reminded that abstracts of papers and addresses must be in the hands of the Program Committee or Section Chairmen by October 1, 1951. Details for submitting papers are recorded in the June issue of the *Journal*.

The Program Committee plans a number of special features for the Convention. With the assistance of the National Society for Crippled Children and Adults, it hopes to provide a film theater for continuous showings of current movies of professional interest.

A session on the last afternoon of the formal program will be devoted to group discussion of special topics. This will give members an opportunity to discuss in small groups, under the leadership of nationally known members, various topics which have aroused particular interest during the Convention. It will also give members a chance to raise questions which could not be presented during the formal meetings.

The Committee on Local Arrangements, Jayne Shover, Chairman, is working to present an interesting schedule of activities and entertainment after business hours.

The program of this Convention will be an outstanding event of the professional year. Your cooperation and suggestions for its successful completion will be appreciated.

PROGRAM OUTLINE

Wednesday, December 26
(Pre-Convention)

9:00 a.m.—Meeting of Executive Council
2:00 p.m.—Sigma Alpha Eta, National Executive Council
3:00 p.m.—Meeting of Executive Council
7:00 p.m.—Meeting of Executive Council

Thursday, December 27

9:00 a.m.-10:00 a.m.—Informal Assembly of Members
10:00-10:30 a.m.—Address of President of ASHA
10:45 a.m.-12:15 p.m.—Section Meetings:
Stuttering (Leon Lassers, chairman)
Clinical Audiology. ASHA, SAA (Leo G. Doerfler, chairman)
12:15-2:00 p.m.—Alumni Luncheons
2:15-3:45 p.m.—Section Meetings:
Public School Problems in Speech Correction. ASHA, SAA (Margaret E. Hall, chairman)
Research in Speech Pathology (G. Paul Moore, chairman)
4:00-5:30 p.m.—Section Meetings:
Speech and Language for the Deaf (S. Richard Silverman, chairman)
Panel Discussion: Therapy for Voice Disorders (Wilbert Pronovost, chairman)
8:00-10:00 p.m.—Business meeting of ASHA membership
(Film Theater, continuous showings)

Friday, December 28

9:00-10:30 a.m.—Voice Communication in Military Applications. ASHA, SAA (John W. Black, chairman)
10:45 a.m.-12:15 p.m.—Section Meetings:
Speech Pathologies of Neurological Origin (Frederic Darley, chairman)
Training of Speech Correctionists (Stanley H. Ainsworth, chairman)

Friday (continued)

12:15-2:00 p.m.—Joint Luncheon of all Associations

2:15-3:45 p.m.—Section Meetings:
Aphasia (Hildred Schuell, chairman)
Research in Audiology (Raymond Carhart, chairman)

4:00-5:30 p.m.—Section Meetings:
Research in Group Therapy (John N. Clancy, chairman)
Structural Abnormalities Affecting Speech (Stanley H. Ainsworth, chairman)

7:00-8:30 p.m.—Meeting of Executive Council

(Film Theater, continuous showings)

Saturday, December 29

9:00-10:30 a.m.—Speech Development and Needs of Childhood (George J. Wischner, chairman)

10:45 a.m.-12:15 p.m.—Section Meetings:
Experimental Phonetics. ASHA, SAA (James Curtis, chairman)
Implications of Current Research for Public School Speech Correction. ASHA, SAA (Duane C. Spriestersbach, chairman)

1:15-2:15 p.m.—Business meeting of ASHA membership

2:30-4:00 p.m.—Section Meetings:
Personality Development and Speech Pathologies (Gordon Low, chairman)
Group Discussions of Special Topics

Editorial Note

IT HAS BEEN NOTED that an article was omitted in compiling the *Cumulative Index to the Journal of Speech and Hearing Disorders, Volumes 1-15*. The following citations should be added:

Falconer, G. A. The reliability and validity of monitored connected discourse as a test of the threshold of intelligibility. 13, 1948, 369-371.

Monitored connected discourse as a test of the threshold of intelligibility, The reliability and validity of (G. A. Falconer) 13, 1948, 369-371.

Reliability and validity of monitored connected discourse as a test of the threshold of intelligibility, The (G. A. Falconer) 13, 1948, 369-371.

Test of the threshold of intelligibility, The reliability and validity of monitored connected discourse as a (G. A. Falconer) 13, 1948, 369-371.

Threshold of intelligibility, The reliability and validity of monitored discourse as a test of the (G. A. Falconer) 13, 1948, 369-371.

An Analysis Of 500 Cases Of Hearing Disability

Hayes A. Newby
Dorothy Munz Molyneaux

THIS ARTICLE is an initial report of a research project analyzing the hearing impairments of the first 500 patients to be processed at the San Francisco Hearing Center—an audiology clinic sponsored by the Ear, Nose, and Throat Section of the San Francisco County Medical Society and Mount Zion Hospital in San Francisco. The material for this project was drawn directly from the case files of the patients involved. Each file includes a medical report from the referring physician or medical agency, air and bone conduction pure tone audiograms, results of speech audiometric examinations, and various other data which are not pertinent to this particular report. The phase of the investigation with which this article is concerned deals with the relationship between the pattern of a patient's losses for pure tones in the so-called speech frequencies and (1) the diagnosis of his impairment, (2) the comparison of his air and bone conduction losses, (3) his speech sound discrimination, and (4) his speech reception threshold. In this analysis each ear is considered separately.

Hayes A. Newby (Ph.D., Iowa, 1947) is Associate Professor of Speech and Drama, Stanford University, and Director of the San Francisco Hearing Center. Dorothy Munz Molyneaux (Ph.D., Stanford, 1949), 27 Rosewood Drive, San Francisco, was formerly Associate Director of the San Francisco Hearing Center. This article is adapted from a paper presented at the 1950 Convention of ASHA, Columbus, Ohio.

Procedure

The subjects consisted of 292 females ranging in age from six to 89 years with a median age of 45, and 208 males ranging in age from six to 81 years with a median age of 46. Seventy-two per cent of these subjects were referred to the Hearing Center for the primary purpose of selecting a hearing aid; 21 per cent were referred for pre- or post-operative audiometry—that is, an analysis of their suitability for the fenestration operation, or an evaluation of the results of surgery, and seven per cent were referred for diagnostic audiometry. All of these patients were examined at the Hearing Center between October, 1948 and January, 1950, an interval of 14 months. The patients were referred by private otologists, E.N.T. clinics, local and state divisions of Crippled Children Services, and the Bureau of Vocational Rehabilitation.

Diagnoses were made by the referring otologist or medical agency in each instance. Since referrals were received from more than 100 different physicians with variations in method and terminology, it was impossible to

obtain precise and usable diagnoses in all instances. Whenever possible, however, each patient was classified in one of seven groups by diagnosis. These groups were designated as: nerve deafness, mixed deafness, conductive deafness, otosclerosis, otosclerosis plus nerve involvement, otitis media, and congenital deafness. It is immediately evident that these groups are by no means mutually exclusive, but they provide a convenient means of classifying the patients by diagnosis. Eighty-five per cent of the patients were grouped in three classifications as follows: nerve deafness, 36 per cent; otosclerosis, 34 per cent; mixed deafness, 15 per cent.

The pure tone and speech audiometric examinations were performed in each case by one of the authors or by a third audiologist performing clinical work at the Hearing Center. All the pure tone tests were administered on a Western Electric 6-B audiometer. All the speech tests were performed with specially constructed speech amplifying equipment of high fidelity and flexibility in a two-room testing arrangement. This article is concerned only with the results of monaural speech testing which was performed with the patient using a Permoflux PDR-8 earphone. Speech reception thresholds were obtained by averaging the results of two recorded tests: Auditory Test Number 14 (spondee words recorded at a constant level), and connected discourse (transcriptions of Fulton Lewis broadcasts). Speech sound discrimination measures were obtained by testing with the Harvard phonetically balanced word lists delivered at intensities from 25 to 35 db above the speech reception threshold in each instance. These articulation tests were all administered with monitored live voice.

Classification of Audiograms

Since the purpose of this phase of the investigation was to observe the relationship between the pattern of a patient's losses for the speech frequencies and certain other measures, it was necessary to classify ears according to the pattern of pure tone loss through the speech frequencies. For this purpose, a classification was devised which enabled the investigators to label each ear definitely according to the relationship of losses at the frequencies of 500, 1000, and 2000 cycles per second.[1] In order to include all possible variations in patterns of loss among these frequencies, 16 categories were necessary. These 16 categories were based on four major patterns of pure tone loss through the speech frequencies and all their possible combinations. The four major patterns were:

1. *F*—flat loss—not more than 5 db variation between successive frequencies.
2. *G*—gradually increasing loss of 10 or 15 db from one frequency to the next.
3. *M*—markedly increasing loss of 20 db or more from one frequency to the next.
4. *R*—rising curve on audiogram; decreasing loss of 10 db or more from one frequency to the next.

These four major patterns alone and in combination could thus describe the relationship between the speech frequencies in any case for which thresholds at 500, 1000, and 2000 cycles per second had been obtained. For example, an *FG* classification would indicate that the difference between the losses at 500 and 1000 cps was no greater than 5 db, while the difference between the losses at 1000 and 2000 cps was a 10 or 15 db increase. On the other hand, a *GF* classification would mean that the loss gradually increased from 500 to 1000 cps but was flat between 1000 and 2000 cps.

[1] This classification was adapted from one suggested by Carhart (*1*).

TABLE 1. Distribution of percentage of ears in pure tone pattern groups by principal diagnoses.*

	F	*FG*	*FR*	*GF*	*FM*	*G*	*MF*	*RF*	*GM*	*GR*
Nerve Deafness	24	41	9	54	48	77	68	29	71	14
Otosclerosis	45	26	61	17	25	3	0	36	7	43
Mixed Deafness	18	19	9	15	12	13	20	14	7	14

*Initials refer to pattern of pure tone loss through the frequencies of 500, 1000, and 2000 cps as follows:

F = flat loss
FG = flat, then gradually increasing loss
FR = flat, then rising (decreasing) loss
GF = gradually increasing, then flat loss
FM = flat, then markedly increasing loss
G = gradually increasing loss
MF = markedly increasing, then flat loss
RF = rising (decreasing), then flat loss
GM = gradually increasing, then markedly increasing loss
GR = gradually increasing, then rising (decreasing) loss

Although 16 groups were necessary in order to classify all of the 912 ears for which thresholds at each of the speech frequencies had been recorded, it was found that 90 per cent of the ears could be classified in only 10 groups. The largest group by far was the *F* (flat loss) group with 30 per cent of the ears so classified. The next largest groups were those designated as *FG* (flat and gradually increasing loss) and *FR* (flat and rising or decreasing loss).

Relation of Audiometric Patterns to Diagnosis

An analysis of ears according to diagnosis and pure tone loss pattern in the speech frequencies revealed that 42 per cent of those in which the hearing impairment had been diagnosed as otosclerosis were classified in the *F* group, 23 per cent in the *FR* group, and nine per cent in the *FG* group. Those diagnosed as nerve deaf were scattered more evenly through four groups: *F*, *GF*, *FM* and *FG*, with the largest single percentage—22 per cent—being found in the *F* group. The largest single percentage of the mixed deaf—38 per cent—was found in the *F* group also, with the next largest percentage being classified in the *FG* group. Because these three diagnoses—otosclerosis, nerve deafness, and mixed deafness—were used to describe 85 per cent of the ears, no attempt was made to analyze the remaining 15 per cent in regard to the relationship between diagnosis and pure tone loss pattern.

Table 1 presents the distribution in each of the major pure tone groups according to the principal diagnoses of nerve deafness, otosclerosis, and mixed deafness. An examination of this table reveals that the *FR* group was composed principally of cases diagnosed as otosclerotics, and the *G*, *GM*, and *MF* groups were composed principally of nerve deaf. From Table 1 it can be noted that six of the groups were composed principally of the nerve deaf, and three of the groups were composed principally of otosclerotics. None of the groups was composed predominantly of mixed deaf.

Difference Between Air and Bone Conduction Thresholds

One of the measures computed for all of the patients for whom both air and bone conduction thresholds were obtainable at the three frequencies of 500, 1000, and 2000 cps was the difference between the average air conduction loss and the average bone conduction loss for those frequencies in each ear. The average difference between air conduction and bone conduction for a total of 484 ears was 29 db. This average is high, because with many of the nerve deaf and the mixed deaf it was not possible to compute this statistic, due to losses in bone conduction greater than the audiometer could measure at one or more of the three frequencies. The range in this statistic was from a high of 34.6 db for group *FR* to a low of 12.2 db for group *G*.

Speech Sound Discrimination Scores

A speech sound discrimination or articulation score was available for 791 ears. The average score correct on PB tests for this total number of ears was 71.36 per cent. Averages were also computed separately for each of the major pure tone groups. These averages ranged from a high of 88.2 per cent correct for the *FR* group to a low of 47.9 per cent correct for the *GM* group.

Pattern Conformity to Accepted Criteria

A diagnosis of nerve deafness is ordinarily associated in the minds of cli-

TABLE 2. Rank order of major pure tone pattern groups in regard to percentage of nerve deafness and otosclerosis, extent of difference between air conduction and bone conduction thresholds, and articulation (sound discrimination) score.

	Per Cent Nerve Deaf (inverse order)	*Per Cent Otoscler-otics*	*Difference AC-BC (greatest to least)*	*Articulation Score (highest to lowest)*
*FR**	1	1	1	1
GR	2	3	2	2
F	3	2	4	4
RF	4	4	3	3
FG	5	5	6	5
FM	6	6	8	6
GF	7	7	7	7
MF	8	10	5	9
GM	9	8	9	10
G	10	9	10	8

*Initials refer to pattern of pure tone loss through the frequencies of 500, 1000 and 2000 cps as follows:

FR = flat, then rising (decreasing) loss
GR = gradually increasing, then rising (decreasing) loss
F = flat loss
RF = rising (decreasing), then flat loss
FG = flat, then gradually increasing loss
FM = flat, then markedly increasing loss
GF = gradually increasing, then flat loss
MF = markedly increasing, then flat loss
GM = gradually increasing, then markedly increasing loss
G = gradually increasing loss

nicians with a pure tone pattern of increasing loss from frequency to frequency, with a bone conduction curve that approximates the air conduction losses, and with relatively poor speech sound discrimination; and usually a diagnosis of otosclerosis is associated with a flat or slightly rising pure tone audiometric pattern, relatively normal bone conduction, and relatively good speech sound discrimination. It is interesting, therefore, to see how consistently these factors do differentiate ears diagnosed as nerve deaf and otosclerotic. This has been done in Table 2 by listing each major pure tone pattern group and showing its rank order in regard to percentage of nerve deaf, percentage of otosclerotics, extent of difference between air conduction and bone conduction, and articulation score. It should be noted that in Table 2 the percentage of nerve deaf is given in inverse rank order, which means that the *FR* group actually contained the smallest percentage of nerve deaf, and the *G* group contained the highest percentage.

Table 2 demonstrates that there is a high degree of consistency between pure tone loss pattern through the speech frequencies, diagnosis of the impairment as either nerve deafness or otosclerosis, difference between the average air conduction and bone conduction losses through the speech frequencies, and the articulation score. Thus it can be seen that the pure tone patterns most typical of the otosclerotic are the *FR*, *F*, *GR*, and *RF* groups in that order, and ears in these groups demonstrate the greatest differences between air and bone conduction curves, and the highest articulation scores. The *G*, *GM*, and *MF* pure tone pattern types are most characteristic of the nerve deaf, and ears in these groups tend to exhibit minimum differences between air conduction and bone conduction curves, and to have relatively poor articulation scores.

The next phase of the present investigation has to do with the accuracy with which the actual speech reception threshold can be predicted from the average loss through the speech frequencies on the pure tone audiogram. Methods used by Carhart (*2*) and Fletcher (*3*) are being tested to determine which would have predicted speech loss more accurately in the 500 cases here reported. A complete statistical analysis of the data is now under way, and conclusions cannot be definitely drawn until this analysis is completed. The results will constitute the subject matter of a second article based on the case records of the San Francisco Hearing Center.

Summary

The present article has been concerned with the relationship between the pattern of a patient's losses for pure tones through the frequencies of 500, 1000, and 2000 cps, the diagnosis of his impairment, and measures of his loss for speech reception and speech sound discrimination. The article was based on the material in the case files of the first 500 patients processed at the San Francisco Hearing Center.

References

1. Carhart, R. Classifying audiograms—an improved method for classifying audiograms. *Laryngoscope*, 55, 1945, 640-662.
2. ————. Speech reception in relation to pattern of pure tone loss. *JSD*, 11, 1946, 97-108.
3. Fletcher, H. A method of calculating hearing loss for speech from an audiogram. *J. acoust. Soc. Amer.*, 22, 1950, 1-5.

An Evaluation Of Hearing Aids Worn By School Children

Carl H. Weaver

THIS STUDY was undertaken to investigate the relation of the hearing loss, sex, and the amount of gain in speech reception afforded the school child who owns a hearing aid to the amount of time the aid is worn each day, and the relation of the aided and unaided thresholds to the number of years the aid has been worn.

How many children wear aids no one knows. Silverman (*11*) wrote,

> Our best estimate is that 1,500,000 to 2,000,000 children in the United States have defective hearing. . . . As nearly as we can judge, there are about 800,000 [adult] users of hearing aids in the United States today.

The United States Department of Health (*2*) estimates that there are 500,000 children in the United States today who need auditory training. Even these uncertain figures do not tell us how many school children wear hearing aids; far less do they tell us how much of the time children who have aids wear them or how much benefit they get from them.

Gates and Kushner (*6*) reported that of 38 children, who were part of a group of 52 original subjects, 21 wore their aids little or not at all, and 17 wore their aids most or all of the time. Significantly, those making maximum use of the aid had hearing losses exceeding 60%, as obtained by Fowler's method (*5*). Only three children with losses greater than 60% did not use their aids advantageously. Two of them were forbidden by their parents to wear the aid outside school hours, and one refused, as a form of rebellion against his parents, to wear the aid. The authors also found that a trend was evident toward diminution in the amount of time the aid was used as the percentage of hearing loss became less.

Curiously, although these figures suggest a nearly perfect correlation of hearing loss and the amount of time the aid was used, such was not the case. For those subjects (55%) who made infrequent or no use of the aids, no relationship existed between the amount of use and the extent of the hearing loss.

Levine and Ness (*10*) found by a questionnaire addressed to parents of children who attended the Lexington School for the Deaf that, of 40 children, 16 were anxious to wear the aid, nine had to be urged, and three refused to wear it.

An experiment run by Utley and Goebel (*13*) at the South Carolina School for the Deaf in 1942, in which they attempted to evaluate seven different kinds of hearing aids, helped to establish the method of this study but did not add to our knowledge of children's hearing aids.

It appears that determination of a speech-reception threshold by use of the pure tone audiometer is still a matter of dispute. Gates and Kushner used Fowler's method. The American Medical Association has adopted an official method of its own (*11*). As late as

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January, 1950, Fletcher (*4*) advanced a new method based upon the average of the two smallest values of loss from the three frequencies 500, 1,000, and 2,000 cps, and an alternative, more complicated, formula which will give a 'somewhat more accurate calculated loss.'

Carhart (*1*) showed that, in interpolating speech reception thresholds from audiograms, although group correlations were high, individual differences were great. He tested 129 men on sentences (Bell Telephone Intelligibility Lists) and 1,105 on Spondee words (Harvard Auditory Test No. 9). The pure tone loss subtracted from the speech reception loss yielded a 'difference' score. Although the mean of the difference scores was only −.5 decibels, individual variations were as great as −52 and +33 decibels. The distribution of the difference scores was the same when speech reception was tested with sentences as when tested with words. Carhart found that at least two significant factors show that the pure tone audiogram cannot be used in individual cases as a measurement of speech reception. First, high tone losses at a slope of 15 to 20 decibels per octave showed six decibels better speech reception threshold than pure tone threshold. All other kinds of audiograms seemed to show approximately the same thresholds. Secondly, cases in which the hearing loss had occurred within the last two years showed a speech reception threshold four decibels better than the pure tone threshold. Carhart theorized also that low intelligence, poor language facility, and psychogenic effects may have had some effect in cases of difference between the two thresholds. Thus, it may be safe to conclude that when small groups are used the speech reception threshold should be determined by administering a speech reception test.

Procedure

Twenty children were tested in two groups. Grade levels ranged from the fourth to the tenth grades, as follows: three in the fourth grade, three in the fifth, six in the sixth, six in the eighth, one in the ninth, and one in the tenth. All were enrolled in the Kennedy School for the Deaf, Dayton, Ohio, or in the Day School for the Deaf and Hard of Hearing, Columbus, Ohio.

The multiple choice (VCL) intelligibility tests (*7, 8*) were adapted and used to determine speech-reception thresholds. Subsequently, Doyne and Steer (*3*) reported a study which demonstrated the adequacy of the tests for testing word reception.

In order to make sure that the words and the administration of the test were within the ability of the subjects tested, the tests were administered to a group of 20 normally hearing fourth-grade pupils selected at random. Their mean score was 84%. The threshold for the hard of hearing pupils was fixed at the point where they marked 50% of the words correctly.

The two tests of children with hearing aids were run in large schoolrooms in the presence of 60 decibels of white noise recorded on a Soundmirror tape recorder. The words were reproduced from recordings and attenuated by means of a Bogen attenuator from 95 decibels to 20 decibels in 5-decibel steps. The children were seated before the speaker in such a way that intensities of the first words were heard by various children at 95 to 88 decibels. Each child kept the same seat throughout the tests.

Three tests were run. First, the hearing aids were removed and the word reception thresholds determined unaided. Second, the aids were adjusted to their most comfortable level while the subjects listened to continuous discourse at 60 decibels of intensity. Fi-

nally, a third test was run during which the children were allowed to adjust their aids at any time during the test. The better of the two aided thresholds was taken as the aided threshold.

The amount of time the aid had been worn and the amount of time the child wore the aid each day was ascertained from the child with the aid of his teacher.

Results

The mean gain in speech reception that accompanied the wearing of hearing aids was 20.8 decibels. Gain scores ranged from −5 decibels to 35 decibels. The mean number of years the aids had been worn was 2.6, ranging from 1 to 6. The mean number of hours the aids were worn each day was 10, ranging from 4 to 14 hours.

The study sought to answer four questions. The results can be presented as answers to these questions.

1. *What is the relationship of gain in speech reception afforded by a hearing aid worn by a school child to the amount of time the aid is worn each day?* The children were placed in two groups: those who wore their aids eight hours or less each day and those who wore their aids more than eight hours each day. The mean gain in speech reception, determined by subtracting the aided threshold from the unaided threshold, was 22.3 decibels for the second group; 5%, 2.1. There was no difference between the groups; *t*, .50. This result is interesting in view of the implications of part of Gates and Kushner's study. Evidently at these ages, the amount of benefit which an aid renders the child has little, if anything, to do with the amount of time he uses it.

2. *What is the relationship of ability to hear, both with and without the aid, and the amount of time the aid is worn?* Here again the children were placed in two groups: those who wore their aids eight hours or less each day and those who wore their aids more than eight hours. A comparison of the aided thresholds of the two groups gave a value for *t* of .57 (5%, 18 df). The mean aided thresholds for those who wore their aids eight hours or less was 60 decibels and for those who wore their aids more than eight hours, 63.2 decibels.

The comparison of the unaided thresholds of the two groups likewise gave a value for *t* which was not significant: .796. The mean unaided threshold for the group who wore their aids eight hours or less was 78.8 decibels and for those who wore their aids more than eight hours, 85.5 decibels.

This result is likewise interesting in the light of Kinney's (*9*) discussion of the two factors of electrical gain of the aid and the character and extent of the hearing loss; and in the light of Davis' (*12*) social adequacy concept.

3. *What is the relationship of sex to the amount of time the aid is worn each day?* The mean number of hours the aids were worn each day by boys was nine hours. For girls the mean was 12 hours. A comparison of the two groups gave a value for *t* of 2.013. The value for *t* required at the 10% level with 18 degrees of freedom is 1.734, and at the 5% level, 2.101. Hence, this value is significant at the 10% level and approaches significance at the 5% level.

4. *What is the relationship of ability to hear, both with and without their aids, to the amount of time the aid has been worn?* First, the children were grouped according to the number of years they had worn hearing aids: those who had worn aids more than 2.5 years (the median), and those who had worn aids 2.5 years or less. The two groups were then compared

to determine the relation of their unaided thresholds.

The mean unaided threshold for the first group was 80.5 decibels and for the second group, 84.5 decibels. The value of *t* was not significant at the 5% level: .485.

Second, the children were grouped according to their aided thresholds: those with thresholds of 60 decibels and below and those with thresholds of 65 decibels and above. The two groups were compared with reference to the number of years they had worn hearing aids. The value of *t* at the 5% level (.180) was not significant.

Thus, there was nothing in this study to indicate that the number of years an aid has been worn has any effect upon residual hearing or upon the aided threshold. The number of years the aids had been owned by the children ranged from ¼ year to six years. Also, no effort was made to determine whether any of the losses had been progressive at the time of the test, although no such progression was revealed by the test results.

Summary

An evaluation of hearing aids worn by 20 school children, ranging from the fourth to the tenth grades, indicates the following conclusions:

1. The amount of gain in speech reception afforded by the aid apparently has little relation to the amount of time the aid is worn each day.

2. There seems to be little connection between hearing loss, both aided and unaided, and the amount of time the aid is worn each day. The child seems to be less concerned about approaching social adequacy in hearing ability than about other things.

3. At these ages girls wear their aids significantly more than boys.

4. The amount of residual hearing seems to have no relation to the length of time the hearing aid has been worn.

There is indicated a need to approach the wearing of hearing aids by school children in a comprehensive fashion in order to determine why they do not wear their aids and what can be done about it.

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A Survey Of Attitudes Of Local Industry Toward The Employability Of The Hearing Aid Wearer

Alice J. Van Deventer
Joseph A. Scanlon

A SURVEY of the attitudes of local industry was conducted by the Aural Rehabilitation Clinic of the U. S. Naval Hospital in Philadelphia, Pa. It was prompted by the statements of former patients who had been fitted with hearing aids and were referred to or returned to the clinic for various reasons. Some of these patients stated that as long as they were wearing hearing aids, it was practically impossible to get a job, but when they applied for a job without the hearing aid, they were hired immediately. Although the men who made this statement were in the minority, it was heard often enough to indicate the need of objective information from the employer himself.

What do employers think about the prospective employee who wears a hearing aid? Should the hearing aid wearer realize that he might meet employers who would be skeptical of his economic value because of the aid? Answers to these questions were sought by means of a questionnaire. Eight questions were asked with application to the last four years. The questionnaire, with a letter of explanation, was sent to approximately 1,500 employers in the Philadelphia area. Within a three-week period, 476 of these questionnaires were returned, covering an employment range of 1 to 120,000 and representing a large variety of business and industry, namely, manufacturing, insurance, banking, retail trades, public utilities, restaurants, recreational facilities, skilled trades, transportation, and professional and semi-professional occupations.

Results have been tabulated in percentage on the basis of the 476 questionnaires that were returned within the time limit and are shown in Table 1.

The answers indicate that a large percentage of employers (66.6%) had had no contacts with those wearing aids, either as employees or applicants for employment. Since Question 3 asks for an evaluation of the efficiency of a hearing aid wearer on the job, the lack of definitive response to this ques-

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TABLE 1. Replies to questionnaire, in per cent. N=476.

	Yes	*No*	*Unanswered*	*Doubtful*
1. In the last four years, has anyone wearing a hearing aid applied for a job in your organization?	30.0	66.6	2.5	0.9
2. Within this time, have you ever employed anyone wearing a hearing aid?	30.9	66.8	2.3	–
3. If you have employed a person wearing a hearing aid:				
a. Is his efficiency comparable to fellow workers?	35.7	3.6	60.7	–
b. Does he miss many instructions?	4.3	31.8	63.1	0.8
c. Does he wear a hearing aid at all times?	7.6	28.3	64.0	0.1
d. Does he work in noisy conditions?	16.6	18.1	63.7	1.6
4. If you haven't employed anyone wearing a hearing aid: Do you object to the idea of a person wearing a hearing aid?	1.5	74.0	24.5	–
Would you reject him because of				
a. The effect on you personally	0.1	48.8	51.1	–
b. The effect on your customers	1.9	45.7	51.5	0.9
c. The effect on fellow workers	0.6	48.5	50.9	–
d. Other reasons	3.4	34.1	62.0	0.5
5. Would the hiring of a person wearing a hearing aid affect your business insurance?	1.7	82.8	7.6	7.9
6. If you wouldn't hire a person wearing a hearing aid, would you tell him:				
a. You do not think he could meet the public	1.7	19.8	78.4	0.1
b. He would miss instructions	4.1	18.2	77.6	0.1
c. You just do not think he could do the work	5.5	17.0	76.9	0.6
d. It is because he is wearing a hearing aid	1.3	20.1	78.6	–
7. Would you consider letting a person show you how well he can get along with a hearing aid by means of				
a. An interview only	39.1	11.2	49.6	0.1
b. A trial employment	43.7	7.2	48.7	0.4

	First	*Second*	*Third*	*Fourth*	*No Answer*	*Won't Hire*
8. Please indicate by number the order in which you would prefer to hire persons with the following disabilities:						
a. Injuries or loss of legs, arms, hands, fingers	4.4	38.2	19.1	11.1	24.2	3.0
b. Internal diseases as heart or stomach	1.3	21.6	39.6	8.6	26.2	2.7
c. Personality disorders	1.0	10.7	10.7	47.4	26.4	3.8
d. Persons wearing a hearing aid	79.9	3.8	0.5	0.7	15.1	–

tion (approximately 60%) confirms this lack of employment contacts. Nevertheless, it is of considerable importance to note that the remaining 30% to 40% agreed that the efficiency of the hearing aid wearer was comparable to other employees and that he missed very few instructions.

Is the idea of the need of a hearing aid objectionable? Evidently not, for 74% of the employers said they had no objections. When asked if they had specific objections, 40% to 50% answered in the negative, while 50% to

60% did not answer at all. In other words, so few answered this question in the affirmative that it is difficult to see how the use or the presence of a hearing aid could be specifically named as the reason for refusal of employment.

Did the hearing aid wearer misinterpret the reasons given for refusal of employment? Question 6 attempted to investigate this possibility, but 75% to 80% did not answer, and only 15% to 20% answered in the negative. Many employers added a comment, however, explaining their inability to answer the question because they had had no applicants.

It has been stated that industrial insurance is a factor in the acceptance or rejection of a hearing aid wearer for employment, but the fact that 82% answered Question 5 in the negative seems to minimize the importance of business insurance as a deterrent to the employment of the hearing aid wearer.

Whether any applicant for a job would be given a trial period, as asked in Question 7, depends upon predetermined policy and is not decided by the fact that a particular applicant is wearing a hearing aid.

Because there has been considerable post-war publicity for 'hiring the disabled' in the Philadelphia area, Question 8 was included to ascertain the possible preference in the hiring of any person with a disability. Nearly 80% of the employers would prefer to hire the person with a hearing aid over those with the other handicaps mentioned. This high percentage may be influenced by the fact that the prime concern of the questionnaire is information about the employability of persons with hearing aids.

The number of questionnaires answered in detail, however, was sufficient to indicate that the statements of those who would blame the use of an aid as a cause of unemployment must be qualified. When comments and letters received with the questionnaires are examined, this conclusion is substantiated and the question of the employability of the hearing aid wearer is further clarified.

Industry in general is receptive to the problem of employment of the hearing aid wearer but indicates the need of selective placement. It is difficult to specify the particular types of work considered most suitable by industry, however, for the conception of proper placement varies. This is true in the same type of business, for while some firms would place a hearing aid wearer in office, sales, or professional positions rather than production, other firms would hire for production rather than sales positions.

In the field of sales, particularly, there were definite attitudes toward the effect of a hearing aid on customer contacts as expressed in the following comment: 'Would not object to hiring a hearing aid wearer, but obviously not for selling positions or positions that require meeting the public.' On the other hand, a greater number of firms stated that they presently employed salesmen wearing aids, whose work compared with the best.

The need of selective placement in other instances was considered from the viewpoint of noise and safety factors rather than efficiency of the worker.

Many employers went beyond the content of the questionnaire and commented at length upon the subject of the hard of hearing. The comments contain valuable hints of the employers' evaluation of the problem of loss of hearing. 'Don't dwell on deficiencies, play upon personality and appearance,' said one employer. This feeling

of acceptance of the hearing aid, of disregarding it, in fact, while looking for basic employment qualifications, is noted again in the following comments: 'If the person was capable before losing his hearing, he is still capable.' And, 'A hearing aid is to enable a user to hear. If this is accomplished, what matters?' This tendency to disregard the aid, to take its functioning so much for granted, suggests, however, that there may be a need of information to the effect that there are problems of adjustment to an aid and limitations in its use, so that impossible results should not be expected.

Many employers, in their comments, indicated an unfavorable attitude toward the hard of hearing individual who needs an aid and will not wear one. In one case, at least, this opposition was sufficient to bring the definite statement that he 'would not refuse a hearing aid wearer employment but would refuse an applicant with deficient hearing and no aid.'

This attitude of the employers toward the problem of the man who has a loss and will not wear a hearing aid as expressed by one employer deserves quoting in full: 'I feel that a person using a hearing aid is to be complimented, as I have experienced difficulty with people in the past who were too proud to wear them, and, if they had done so, it would have been a great asset to them not only in their work, but in their advancement.' In some instances, a practical solution of this problem was sought by employers who requested or helped employees get a hearing aid.

Although there were some comments clearly indicating that the questionnaire was answered from the viewpoint of employers of deaf mutes, there seemed, in general, to be an appreciation of the fact that the hard of hearing condition was one that could be successfully rehabilitated, in most instances, by means of a hearing aid.

Results of the survey indicate that:

1. Business is favorable toward hiring the man who wears a hearing aid, but unfavorable toward hiring the man who has a hearing loss and will not wear a hearing aid.
2. The man wearing a hearing aid is more acceptable for employment than men with other disabilities.
3. Insurance is not an important item in accepting or rejecting an applicant for a job.
4. Ability and personality are still considered the important items in determining employability, despite the wearing of a hearing aid.
5. Business believes in the selective placement of the hearing aid wearer. When the hiring policies of various firms are examined, it is realized that an applicant might be refused a particular job because 'he was wearing a hearing aid.' The understanding of selective placement is by no means consistent in every firm, since identical employment situations have been considered both acceptable and non-acceptable for hearing aid wearers.

Whether industry wants or needs more information about the efficient use of hearing aids is not within the scope of this questionnaire to answer.

An Analysis Of The Utley Lipreading Test

Louis M. DiCarlo

Raymond Kataja

ONE OF THE challenging problems in the education of individuals with impaired hearing has been the development and construction of standardized achievement tests of lipreading ability. Such tests might provide cues for predicting lipreading success and making satisfactory school placement, and would undoubtedly contribute to more adequate training programs.

Educators have long felt the need for such tests. As early as 1915, Kitson (*cited, 6*) sought to develop tests as a means of prognosticating ability of the deaf to read lips. Gopfert (*cited, 6*) stressed the importance of letters and syllables, while Goldman (*cited, 6*) emphasized semantic orientation especially with respect to the demands of situations. It was not until 1923, however, that Day, Fusfeld, and Pintner (*cited, 6*), under the sponsorship of the American Research Council, constructed tests which aroused general interest. Series of tests were administered by both classroom teacher and field representative. The results of these tests were compared and evaluated. These tests are among the first efforts to measure lipreading ability objectively. Mason (*4*) later presented sentences and paragraphs together with score sheets for the examiner's use in an effort to approach greater objectivity.

While these contributions were unquestionably important, they still failed to satisfy the need for a standardized test to measure achievement in lipreading. The development of motion pictures presented an entirely new medium with which to attack the problem. Attempts to use motion pictures for testing lipreading ability began to appear in 1930 when Beilensson (*cited, 6*) experimented with photographs of the lips in sound positions. About that time, Mason (*4*) and Morkovin and Moore (*5*) were developing motion pictures for the basis of lipreading instruction. An extensive report from the Psychological Research Department of Clarke School for the Deaf appeared in 1940. Heider and Heider (7) used several lists of words, sentences and two short stories about 150 words each. They reported intercorrelations ranging from .77 to .95 between the different tests. Correlations between C.A. and lipreading were low, while between educational age, as measured by the Stanford Achievement Test, and lipreading

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achievement the correlation was .54.

Similar techniques were employed by Utley (*10*) in the motion picture, *How Well Can You Read Lips?*, published in 1946. The film has two parts: A and B. It was standardized and made available to measure lipreading achievement of deaf and hard of hearing children and adults with a reading level of the third grade and above. The utilization for Form A of this test at Syracuse University revealed that the subjects found it so difficult that about 50% of the items were not functioning. The administration and results of this test suggested that a further analysis might evaluate its utility and also indicate some points which needed refinement. Form A was employed in this study.

The test is made up of three kinds of material, each emphasizing meaningful speech units. The Sentence test is made up of common expressions and idiomatic sentences based on suggestions from previous experiments in the language field together with samples taken from ordinary conversation. There are 31 items in this part. The Word test consists of 36 words taken from Thorndike's Teacher's Word List of most frequently used words. The third and final part is the Story test which consists of six stories based on interest and experience thought to be common to the lives of children of intermediate or high school age. Each story is developed around a supposedly familiar experience which is revealed in the conversation of the speakers. Each story is followed by five questions. The material is presented by a little boy, two women and a man. The subjects were photographed in the environmental situation in which the incidents might have occurred. The first two parts are in black and white, the stories in color. Blank film of sufficient length to allow 15 seconds between sentences, 10 seconds between words and 15 seconds between questions is interspersed between test items.

Utley administered the test, for the purpose of standardization, to 761 deaf and hard of hearing individuals in four large cities. Children from one large state residential school, four public elementary day schools, two conservation of hearing classes in a public school system and one society for the hard of hearing composed the group which took the test. The group was considered to represent a cross-section of the acoustically-handicapped school population.

Theoretical Considerations. The claimed advantages of motion pictures for measuring achievement in lipreading is largely one of operational efficiency. First, it approaches a certain objectivity by providing control of the constancy of speech movements, the visibility of speech presentation and the rate of speaking. Second, since no hearing is involved, the lipreader is more free to concentrate attention on the visual speech patterns.

There are, however, some controversial elements concerning the use of motion pictures as a standardized test of lipreading ability. First, the degree to which this medium approaches the real life situation is not fully known. At the optimal level the approximation may be very close, though probably never as good as a well-conducted natural situation. There has been little agreement concerning those factors that discriminate between potentially good and poor lipreaders. Learning itself is correlated with intelligence, grade status, length of

training, chronological age, and achievement in other fields. Nevertheless, Reid (*8*) reports that when children are given motion picture tests, none of these factors seems to be important insofar as the youngster's ability to read lips is concerned. Even the amount of training the youngsters have had above a certain minimal level does not seem to matter in their ability to lipread. Similar results have been found for intelligence, grade status and chronological age. 'We find that we do not know what factors are important for the learning of this will-o'-the-wisp thing called lipreading' (*9*).

There are other variables necessary in the construction of a motion picture test of achievement in lipreading which may be more closely evaluated. First, it would seem that intelligible articulation is a prerequisite. But such articulation in itself would not be sufficient, for other verbal and nonverbal clues such as body tension, facial grimaces, and semantic evaluation of the situation are also involved. Yet word clues are tremendously important in successful speechreading and cannot be ignored in the development of lipreading tests.

> A lipreader quickly detects changes in emotion; the twinkle of an eye, sternness of mouth and jaw, poise or drop of chin, an expression of entreaty, of pity or of command. All these changes of expression are a normal part of word messages. They carry the emotional atmosphere to the person who is debarred from hearing the sound a speaker's voice gives (*1*).

The construction of lipreading tests should include consideration of the more basic elements in lipreading operations. Thought comprehension on the part of the lipreader is a synthesis of a number of interactions, both physiological and psychological. The subject utilizes the physiological in recognizing such movements as those made by the lips, tongue, and teeth, and then translating these movements into meaning. A factor which often interferes with these physiological processes is the discrepancy between the speed with which speech can be uttered and the speed of the eyes in following such lip movements. Speech can be uttered at a greater speed than the eyes can see. Furthermore, many sounds become obscure in rapid speech, while others are invisible such as [k], [ŋ], and [g] (*13*). Moreover, homophones, sounds and words with the same movement but different meaning, provide another obstacle. Finally, varying pronunciations and different movements of the lips and face are present in the speech of every individual. This phenomenon is particularly true with respect to different geographical sections of the country.

To overcome these difficulties, the lipreader utilizes his perceptive and conceptive functions as integrative agents, helping him to construct the whole idea from the various relationships indicated by the movements. This process is called 'synthesis,' getting the thought as a totality and filling in with a high degree of experience the speech which the eyes do not permit the lipreader to see. Dependency on identifying single movements would seem insufficient. In addition, the rapidity of movements in speech is too great for such practice because by the time one word is visually perceived many others have passed. For this reason, lipreaders are encouraged from the beginning to watch for phrases and sentences as a whole, i.e., for meaning.

In addition, test constructors must keep in mind that lipreaders, to master

the skill, must capitalize on minimal clues. This serves to direct their faculties into the proper channels and allow for alertness in sizing up the semantics of the situation. Inasmuch as this function is an integral part of lipreading, it necessitates inclusion in the construction of the test.

Proposed Analysis of Utley Test

This study aims to determine whether or not the Utley film is a valid and reliable instrument to test achievement in lipreading and whether the test discriminates between good and poor lipreaders.

Subjects. The Utley Test was administered to a group of aurally-handicapped subjects and to a group of normal hearing individuals. In the former group were 57 people, nine of whom had had no formal lipreading training; the average formal lipreading training for the others was five years. Each person had a loss of at least 50 decibels in the better ear. The subjects, all of whom were residents of Syracuse and vicinity, included children, adolescents and adults. They came from elementary schools, lipreading classes, a society for the hard of hearing and several residential schools for the deaf. Some were deaf or hard of hearing since birth, others from childhood. These people depended almost entirely upon lipreading for communication.

The normal hearing group consisted of 44 individuals, none of whom had any lipreading training. These subjects were university students, 18 to 24 years of age.

Administration of Test. The Utley Test was conducted under conditions set up by Utley herself. It was administered in a room adequately darkened to insure a clear-cut image. No more than 15 people were tested at any one time, the average being about eight. The scoring was accomplished in a manner identical with Utley's, the items scored either right or wrong. One revision, however, was necessitated by the omission of Sentence 2 of Part 1 from the scoring because of faulty projection on the screen. This reduced the total score for Part 1 from 124 to 120 and the total score for the test from 190 to 186.

Validity. Utley reports

> The validity of the test is undeterminable. It may not be possible to include in a test of lipreading ability a sufficiently wide range of material or the proper type of material in order to evaluate lipreading proficiency. . . Regarding the present test, however, the validity seems to be established by its logical derivation as a representative work-sample from every day life and by high reliability of the interrelationships of the test material (*11*).

An effective method of determining the validity of a test is to correlate it with an independent criterion that already measures achievement adequately. A reasonable hypothesis would be that lipreading must be measured against actual performance in lipreading just as a test of typing must be meaured against performance in typing. A functional type of lipreading ability, then, was believed to fulfill the requirements of a criterion.

This criterion was obtained by having the subjects answer questions asked by a lipreading instructor about a motion picture they had viewed. This film, called *A Family Dinner* (*5*), was not devised as a test but rather as a teaching device, and represents a life situation. After showing the film, the lipreading instructor asked 20 questions related to the material, through a glass paneled sound-

proof room. He then grouped the subjects into three categories according to the number of correct responses. Individuals getting 80% or more of the material correct were classified as having good lipreading ability, those who scored 60% to 79% were considered average, and all those who scored less than 60% were considered as having poor lipreading ability. These results were correlated with the results of the Utley Test and the validity coefficient obtained.

Certain weaknesses exist in the criterion of validity. The individuals were grouped into three classifications of lipreaders. Some degree of accuracy is lost by this coarseness in grouping. Moreover, the criterion scores were the result of one examination from the lips of one instructor. Since the responses may have been influenced by uncontrollable factors, it would have been desirable to use the pooled abilities of a group of competent persons.

An important factor in the investigation of the validity of the Utley Test is a comparison of the results obtained by the experimental group of aurally-handicapped with lipreading experience and the results of the normal hearing group who had not had the advantage of lipreading training. Such a comparison is crucial as it will answer the question whether or not individuals with no training can produce results comparable to subjects who are practiced in reading lips. The test is expected to discriminate in favor of the aurally-handicapped group with lipreading training.

To obtain an answer to this question the results of both sets were compared by use of the equation to test the significance of the difference of two means (*3*). Since this technique assumes equality of variances, the formula to test the assumption of homogeneity of variance (*3*) was applied.

Reliability. Two measures of reliability were utilized. The split-half method was accomplished by correlating the score on the even numbered items against the scores on the odd numbered items by means of the product moment correlation formula. Since this calculation yields the reliability of half the test, an estimate of the reliability of the whole test was obtained through application of the Spearman-Brown prophecy formula (*2*). The second technique was the Kuder-Richardson formula for estimation of reliability (*12*). This was chosen because, to some extent, it overcomes the disadvantages of the split-half method. Use of the formula eliminates the problem of selecting appropriate halves of the test. It takes into consideration item-test correlation coefficients and the difficulty value of each item and has the advantage of yielding a unique value as a reliability coefficient without the use of a prophecy formula.

Since all the parts of the Utley Test purport to measure the same function, internal consistency can further be evaluated by means of correlation coefficients between the three parts of the test taken in pairs. The

TABLE 1. Classification of the 57 aurally-handicapped subjects on the external criterion.

Group	*Frequency*	*Range of Scores on Utley Test*
Group III—80% and above	13	39-73
Group II —60% to 79%	34	10-55
Group I —below 60%	10	0-23

TABLE 2. Means and variances on the Utley Test of the high and low criterion groups of aurally-handicapped subjects.

	N	*Range*	*M*	*s*	s^2
Group III (High)	13	39-73	54.77	11.08	122.82
Group I (Low)	10	0-23	8.70	7.46	55.61

interrelation of skills required for each of these parts can thus be checked.

Item Validity. The validity of the individual items was investigated by analogous methods to those for the test validity. Each item was correlated by means of the point biserial formula (*12*) with a criterion, namely the total score on the test. The purpose was to determine the discriminating value of each item and to give some insight as to the internal consistency of the test. In an internally consistent test, items dovetail together in working toward the same end. While no attempt will be made to improve the test or the items, it would be of interest to gain some knowledge of the characteristics and the functioning ability of the items of the test.

Difficulty. Difficulty alone is not a dependable measure of the discrimination value of an item (*9*). A study of the difficulty of the test items, nevertheless, will contribute much towards effective discrimination inasmuch as it indicates the extent to which the items function. Items that are too difficult or too easy fail in discriminating effectively between superior and inferior subjects. In the case of the test as a whole, difficulty is shown by the frequency distribution of the scores of the sample group. Measures of central tendency show the general level of difficulty for the test. The difficulty of any particular item was obtained by counting the number of persons answering correctly. The number, expressed as the percentage of individuals trying the item, is called the difficulty index.

Validity

The classification of the 57 aurally-handicapped subjects based on their answers to questions following the showing of the film, *A Family Dinner* (*5*), was compared with their scores on the Utley Test, as shown in Table 1. There is a noticeable overlapping of the range in scores on the Utley Test. The validity criterion was .77.

If the criterion is valid and if the test measures what it purports to measure, the *t* value for the difference between the means of the high criterion group and the low criterion group

TABLE 3. Means and variances of 57 aurally-handicapped and 44 normal hearing subjects on the Utley Test.

	M	s^2	*s*
Normal Hearing			
Part 1	30.11	111.18	10.54
Part 2	5.23	5.77	2.40
Part 3	4.36	5.42	2.33
Total	39.70	171.21	13.08
Aurally-Handicapped			
Part 1	26.26	186.85	13.67
Part 2	5.63	9.40	3.07
Part 3	3.89	11.86	3.44
Total	35.79	342.41	18.50

TABLE 4. Values of *F* and significance of difference in variability between scores of 57 aurally-handicapped subjects and 44 normal hearing subjects on the Utley Test.

	F	*Significance**
Part 1	1.67	Not at 5% level
Part 2	1.62	Not at 5% level
Part 3	2.17	At 5% level
Total	1.99	At 5% level

* *F*, 56 & 43: 5%, 1.81.

will result in statistically significant differential performance by the two groups. Preliminary calculations produced the results shown in Table 2.

The hypothesis of no significant difference in the means of the two groups appears to be unsound inasmuch as the difference in the means is noticeably great. Calculations produced a *t* value of 10.79 which is significant beyond the 1% level of confidence. Consequently the hypothesis is rejected and differential performance is noted between the upper and lower portions of the criterion group.

A basic underlying assumption of the *t* test, namely, homogeneity of variance, was investigated by the *F* test. The value of *F* was 2.16, which is not significant at the 5% level of confidence.

The next important question is whether or not the Utley Test differentiates between people with lipreading training and those without training. The *t* test, to test the significance of the difference of the means between those subjects with lipreading training and those without, was employed. Results of initial calculation for the means and variances are shown in Table 3.

The hypothesis to be taken is that there is no significant difference between the means of the aurally-handicapped group and the normal hearing group with no lipreading training. The *t* test was applied to each of the three parts and to the total. Although the means of the normal hearing group were higher with the exception of Part 2, in each case *t* failed to equal 1.96, required for significance at the 5% level of confidence.

The hypothesis of homogeneity of variance, an underlying assumption to the use of *t*, was also investigated by the *F* test and presented in Table 4. Part 1 and Part 2 are shown to possess no significant difference at the 5% level in variances between the Utley Test scores of the 57 aurally-handicapped subjects and the 44 normal hearing individuals. Significant differences at the 5% level are noted for the variances on scores obtained on Part 3 and on the total Utley Test.

Reliability. The reliability was measured in two ways. In this manner, consistency of results will enhance the trustworthiness of the con-

TABLE 5. Split-half reliability coefficients and corresponding Spearman-Brown prophecy coefficients for the total and the three parts of the Utley Test based on a group of 57 aurally-handicapped individuals.

	Total	*Part 1*	*Part 2*	*Part 3*
Split-half *r*	.94	.94	.53	.84
Spearman-Brown *r*	.96	.96	.69	.91

TABLE 6. Point biserial correlation of coefficients and difficulty indices of the sentences of the Utley Test based on a group of 57 aurally-handicapped individuals.

Sent.	*Item*	*Pt. Bis.*	*Diff. Index*	*Sent.*	*Item*	*Pt. Bis.*	*Diff. Index*
1	1	.68	.68	15	50	.43	.12
	2	.54	.63		51	.43	.12
2*	3			16	52	.49	.56
	4				53	.62	.63
	5				54	.63	.61
	6				55	.62	.60
3	7	.13	.28		56	.61	.61
	8	.19	.07		57	.61	.61
	9	.04	.04	17	58	.35	.54
4	10	.14	.44		59	.33	.40
	11	.17	.35		60	.37	.53
	12	.18	.14		61	.34	.44
5	13	.56	.58	18	62	.44	.56
	14	.55	.58		63	.53	.43
	15	.53	.58		64	.40	.40
6	16	.34	.05		65	.53	.43
	17	.32	.19		66	.39	.32
7	18	.20	.12	19	67	.56	.68
	19	.25	.02		68	.40	.35
	20	.17	.18		69	.38	.18
	21	.13	.04		70	.17	.04
8	22	.18	.16	20	71	.17	.04
	23	.43	.16		72	.27	.04
	24	.33	.19		73	.00	.00
	25	.41	.19		74	—.11	.02
	26	.15	.02		75	—.11	.02
	27	.00	.00	21	76	.00	.00
9	28	.34	.53		77	.00	.00
	29	.44	.21		78	.00	.00
	30	.35	.46		79	.23	.05
	31	.51	.60		80	.23	.05
10	32	.57	.60		81	.24	.02
	33	.47	.53	22	82	.48	.37
	34	.67	.56		83	.17	.09
	35	.40	.39		84	.40	.09
11	36	.14	.04	23	85	.35	.23
	37	.00	.00		86	.37	.21
	38	.00	.00	24	87	.14	.16
	39	.11	.02		88	.00	.00
12	40	.44	.60		89	.09	.02
	41	.44	.46		90	.00	.00
	42	.35	.43	25	91	.42	.23
	43	.39	.44		92	.06	.02
13	44	.40	.23		93	.04	.05
	45	.39	.25	26	94	—.08	.02
14	46	.54	.33		95	.00	.00
	47	.59	.53		96	.00	.00
	48	.57	.65		97	.00	.00
	49	.59	.30		98	.21	.05

*Sentence 2 omitted from scoring because of faulty projection on screen.

(Table 6 continued)

Sent.	*Item*	*Pt. Bis.*	*Diff. Index*
27	99	.43	.27
	100	.25	.09
	101	.30	.12
	102	.18	.07
	103	.02	.05
28	104	.20	.14
	105	.14	.02
	106	.35	.14
	107	.00	.00
	108	—.04	.02
	109	.29	.09
29	110	.10	.02
	111	.00	.00
	112	.00	.00
	113	.00	.00
	114	.00	.00
	115	.10	.04
30	116	.00	.00
	117	.00	.00
	118	.00	.00
	119	.11	.02
	120	.11	.02
31	121	.44	.44
	122	.25	.25
	123	.00	.00
	124	.00	.00

clusions. The reliability coefficients were computed for the three parts and for the total test. The split-half method, where the odd numbered items are correlated with the even numbered items, yielded the results given in Table 5. The Spearman-Brown prophecy formula was utilized to estimate the reliability for the whole test, since the split-half r is the result of one half correlated against the other half.

The Kuder-Richardson formula yielded results very similar to the split-half and the Spearman-Brown reliability coefficients. The Kuder-Richardson reliability coefficients for the total and the three parts of the Utley Test based on the group of 57 aurally-handicapped individuals were .95 for the total test; .94 for Part 1; .65 for Part 2; and .82 for Part 3.

The Word test (Part 2) possesses the lowest coefficient of reliability. Consequently, it can be said that words alone do not measure lipreading as consistently as do sentences or groups of words. Similarly, the stories do not measure lipreading as con-

TABLE 7. Point biserial correlation coefficients and difficulty indices of the words of the Utley Test based on a group of 57 aurally-handicapped individuals.

Words	*Item*	*Pt. Bis.*	*Diff. Index*
1	125	.69	.51
2	126	.13	.11
3	127	.10	.35
4	128	.56	.60
5	129	.26	.05
6	130	.15	.04
7	131	.21	.21
8	132	.10	.07
9	133	.12	.14
10	134	.44	.18
11	135	.14	.05
12	136	.30	.25
13	137	.33	.39
14	138	.60	.33
15	139	.22	.14
16	140	.00	.04
17	141	.00	.00
18	142	.22	.14
19	143	.19	.05
20	144	.32	.07
21	145	—.15	.05
22	146	.00	.00
23	147	.37	.14
24	148	.21	.04
25	149	.15	.11
26	150	.25	.16
27	151	.21	.30
28	152	.11	.04
29	153	.06	.04
30	154	.09	.02
31	155	.20	.44
32	156	—.04	.02
33	157	.16	.28
34	158	.06	.11
35	159	—.11	.04
36	160	.15	.18

TABLE 8. Point biserial correlation coefficients and difficulty indices of the items of the story part of the Utley Test based on a group of 57 aurally-handicapped individuals.

Story	*Item*	*Pt. Bis.*	*Diff. Index*
	161	.45	.61
	162	.50	.25
1	163	.47	.12
	164	.56	.30
	165	.41	.37
	166	.08	.09
	167	.00	.00
2	168	.42	.25
	169	.07	.09
	170	.00	.00
	171	.47	.32
	172	.00	.00
3	173	.00	.00
	174	.00	.00
	175	.00	.00
	176	.18	.09
	177	—.01	.04
4	178	.00	.00
	179	.29	.18
	180	.52	.25
	181	.51	.39
	182	.36	.23
5	183	.45	.23
	184	.15	.04
	185	.00	.00
	186	—.11	.02
	187	.10	.04
6	188	.00	.00
	189	.10	.02
	190	.00	.00

sistently as sentences but more so than words. The Sentence test (Part 1), comprising almost 65% of the total number of items, yielded high reliability coefficients by both methods.

Intercorrelations of Parts. The intercorrelations of the parts taken two at a time for 57 aurally-handicapped subjects were .78 for Part 1 (sentences) versus Part 2 (words); .61 for Part 1 (sentences) versus Part 3 (stories); .51 for Part 3 (stories) versus Part 2 (words). From these coefficients come a measure of the internal consistency through the interrelations of the skills required of sentence, word, and story recognition.

Item Validity. Each individual item, in a sense, is a test of lipreading in itself. The validity of each item is the extent to which the item measures what it purports to measure. The validity coefficient is the result of correlating success or failure of each item against a criterion, the total test score.

These values are given, item by item, in Tables 6, 7, and 8. It is an advantage to present the point biserial correlation coefficients and the difficulty indices separately, but in one table, so that a direct comparison of the amount of discriminating power of the items at each level of difficulty can be made.

The observer will note first that most of the items correlate positively with the criterion of the total test scores. This means that the items on the whole discriminate with varying degrees of success. Table 9 gives a breakdown of the scores.

With 35 items registering zero correlations the frequency polygon, Figure 1, of the point biserial r values shows a preponderance of values at that level. The average point biserial r is .23 and the range is from minus

TABLE 9. Breakdown of point biserial correlation coefficients of items on Utley Test, based on scores of 57 aurally-handicapped subjects.

1. No. of pt. bis. r greater than zero	141
2. No. of pt. bis. r equal to zero	35
3. No. of pt. bis. r smaller than zero	10

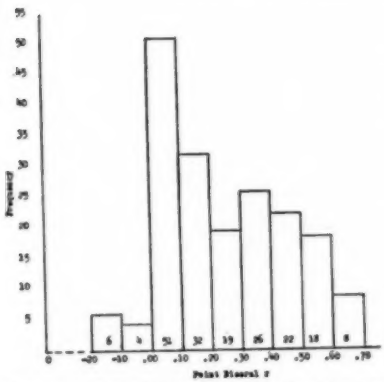

FIGURE 1. Distribution of the point biserial *r* values for 57 aurally-handicapped subjects on the items of the Utley Test.

.15 to plus .69, a distance of 84 units. The median is .205 and the interquartile range is .37, 50% of the cases falling between .04 and .41.

The point biserial values are distributed fairly evenly throughout except for the disproportionate number about zero, resulting in a positively skewed frequency polygon. Of the 141 point biserial values that are greater than zero, 79 are significantly different from zero at the 5% level. Of the total of 186 items, 107 items, or 58% of the test, do not have discriminating powers significantly different from zero, resulting in a serious decrease in the functional efficiency.

Item difficulty. One of the measures which indicates the difficulty of the Utley Test is the mean, which is 35.79, only 39% of the total maximum score of 186. The frequency polygon of the scores, Figure 2, portrays a negatively skewed distribution with a clustering of scores to the right of the mean and a prolongation of the tail to the left. The median score is 39.50 and the interquartile range is from 23 to 49, a distance of 26 units.

The frequency polygon of the difficulty indices of all the items of the Utley Test (Figure 3) is inverse J-shaped, representing a highly positively skewed graph. The graph reveals a disproportionate number of indices about zero, indicating that nearly half the items were not being answered correctly if at all. The highest index is a .68 and the lowest is an aggregate of 34 items which have indices of .00.

The mean difficulty indices of the total and three parts of the 186 items on the Utley Test, based on scores of the 57 aurally-handicapped subjects, were .19 for total test; .22 for Part 1 (sentences); .15 for Part 2 (words); and .13 for Part 3 (stories). With the exception of Part 1, less than one of every five questions were being answered correctly. The highest score attained was a 73, representing but 39% of the total maximum score. The mean score of the test is 35.79, only 19% of the maximum score. The mean score of the test is 35.79, or 19% of the maximum score, slightly less than one item of every five asked.

The difficulty of the test is attested by the following calculations:

1. 50% of the items were answered correctly by only 2.89% of the subjects.

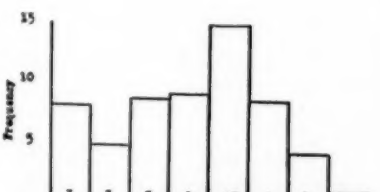

FIGURE 2. Distribution of scores of the 57 aurally-handicapped on the Utley Test.

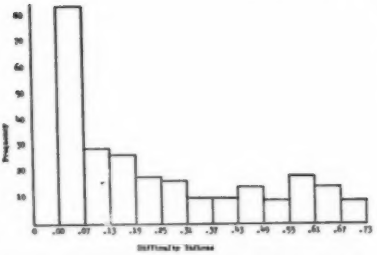

FIGURE 3. Distribution of the difficulty indices of the 186 items of the Utley Test, based on the scores of the 57 aurally-handicapped subjects.

2. Only 26 items, 14%, showed difficulty indices of .50 and above while the remaining 160 items, 86%, had difficulty indices of below .50.

3. Of the 186 items, 78 or 42%, had difficulty indices of .05 and under.

The average difficulty indices of the stories in the Utley Test based on results of 57 aurally-handicapped subjects for each story was .329 for Story 1; .084 for Story 2; .066 for Story 3; .108 for Story 4; .175 for Story 5; .014 for Story 6.

Up to this point the difficulty and the discriminating value of each item of the Utley Test has been determined. Since the Utley Test is to be used as a measure of achievement over several grades, the discriminating value of the items is of major importance. Theoretically, maximum discrimination is attained by having items of 50% difficulty. The average difficulty index of the Utley Test is 19%, representing a substantial decrease in the efficiency since the number of discriminations is considerably smaller. Inasmuch as nearly 50% of all the items were answered correctly by less than 3% of the subjects, the presence of a considerable number of undiscriminating items, which contribute nothing to the test, is revealed. The portions of the test that can be passed by no one cannot differentiate between people who are good and who are poor in ability to read lips.

Discussion and Conclusions

The Utley Test has been subjected to a statistical analysis based on its administration to 57 aurally-handicapped individuals and to 44 normal hearing people who had no lipreading experience. When the performance of the 57 aurally-handicapped subjects on the Utley Test was compared with their performance on an external criterion the resulting correlation coefficient was .77. The external criterion was developed through questions asked at the conclusion of the showing of another film, *A Family Dinner*. An instructor then grouped the aurally-handicapped subjects into three classifications of lipreaders: good, average, and poor.

If the criterion is valid and if the Utley Test measures what it purports to measure, the *t* value for the difference between the means of the high criterion group and the low criterion group will result in statistically significant differential performance by the two groups. The resulting *t* value proved to be significant beyond the 1% level of confidence and differential performance is noted between the two groups.

Results obtained from application of the *t* test between the mean score of the aurally-handicapped people and the normal hearing people showed there was no significant difference between groups differing in lipreading training.

The two highly important results presented above appear to conflict with one another. It is conceivable, however, that the normal hearing

group, due to differential ability to interpret cues, likewise might have performed similarly on the Utley Test and the external criterion. The question then arises whether the Utley Test is really a test of lipreading or something else. The test discriminates reasonably well within groups, witnessed by the validity coefficient of .77 that was obtained by correlating the Utley Test scores against the results of the external criterion. Since it fails to differentiate between groups with unequal lipreading training, an examination of some possible causes is made in the ensuing paragraphs.

The Word test is scored by giving one point for each item answered correctly. Inasmuch as lipreaders are trained to watch for phrases and sentences as a whole rather than isolated words, Part 2, offering individual words, presents no advantage to them. The Sentence test (Part 1) results revealed that few subjects were answering the sentences as a whole. Since one point is given for each word correctly answered, the Sentence test is reduced to a test of words. The more intelligent of the subjects, given a few words, are able to fill in the missing segments if the thought is understood. The sentences had no continuity from one to the other, however, and cues, except for a smile or a nod, were lacking, thus offering no significant advantage to the aurally-handicapped group with lipreading experience.

In order to arrive at some insight into the reasons for the difficulty on the part of the handicapped subjects to answer the items more successfully, each individual was allowed to express his feelings and evaluations of the film at its conclusion. A common criticism offered was the rapidity of speech by the speakers in the film. Some also complained that the speakers failed to express themselves in a normal manner, and that smiling during the process of formulating the words created distorted articulation. Confusion was introduced, moreover, when the speakers moved their heads while talking. Surprisingly enough, the lipstick on the female speakers was reported as a distracting element in the colored film. Some indicated the lack of mobility in lip movements, particularly of the mother in the story film, as disturbing their understanding.

Some of the criticisms are undoubtedly the result of rationalization on the part of the subjects, since speech was uttered at normal rates. Other complaints, however, have more merit. In the Sentence and Word tests, the presentation was initiated by holding up a card indicating the number of the item. Some subjects commented that their eyes followed the card as it was brought down and consequently their eyes were not focused on the lips when the item was begun.

The most persistent criticism was registered against the lack of situational clues. This probably contributes a major portion of the difficulty encountered in the test. The experienced subject utilizes his ability to capitalize on minimal clues in anticipating what he will be called upon to lipread (*13*). Contextual clues direct his thoughts to the subject under discussion and facilitate understanding of the message.

The parts of the Utley Test which would be affected most by the lack of contextual clues are the stories. Story 1 had the highest average difficulty index and can be assumed to be the easiest story for the lipreader to comprehend. Here the scene pertained

to the purchase of a bathing suit and clues are noticeable throughout. It was apparent that the mother had been out since she wore a hat and carried a package. The son became visibly excited, leading to the conception that the package was for him.

The lowest difficulty index was for Story 6, a telephone scene in which clues are noticeably absent. A gentleman answered the telephone and, in talking to the other party, gave no hint as to the context of the conversation. It is not surprising that the lipreader failed to understand the scene since no situational clues are present to direct his thoughts into the proper channels. Similar judgment can be made of Story 3, which, with a difficulty index of .066, was the second hardest of the stories for the lipreader to understand. Here the mother and the son were talking of something outside the house, which was the only contextual clue presented to the lipreader.

It would appear that in the construction of the test there is a failure to consider the psychology of the hearing handicapped subjects. The stories, with the possible exception of Stories 1 and 5 appear inadequate for the purpose intended. Even the very best lipreaders did not succeed in understanding the conversation which developed in the scenes. The higher scores in Stories 1 and 5 may be attributed to the help which contextual cues gave in interpreting the conversation.

Ewing (*1*) reports that she attributes most successful lipreading to the other party of the conversation who takes cognizance of the situation and endeavors to aid the understanding of speech by the lipreader. Similar factors must be evaluated in the construction of an achievement test for lipreaders. The deaf and hard of hearing need material given in such a manner as to allow at least minimal use of situational clues and to allow sufficient time to recognize the meanings in the gestures and facial expressions.

If the lipreader does not have sufficient clues to help him in interpreting the meaning, he will then be thrown upon his ability to understand thought by the movements of the lips alone. The result indicates the test is so difficult that the average score, 35.79, was only 19% of the maximum 186. Furthermore, if the group with no lipreading experience can perform as well as a group of practiced lipreaders on such a test, this would indicate that dependency of understanding speech by lip movements alone is insufficient in discriminating between the two groups.

One of the subjects, a teacher of lipreading with over 20 years experience, who because of very serious hearing impairment depends entirely upon lipreading, had such difficulty with the test that she refused to allow her pupils to participate in the experiment, feeling that it would destroy their self-confidence which she had worked so hard to develop. This factor must be of serious concern to the hearing impaired individual, since, like most individuals in a handicapped group, he may be highly conscious of his deficiencies and tend to withdraw from contacts with normal people. Because the scores obtained on the Utley Test were so far below maximum, few subjects accepted the results of the test with any sense of security. The test discouraged even the most accomplished lipreaders. In

addition to being a test of lipreading ability, the test seems to be one which tests the ability to tolerate frustration and persistent failure.

In its present form, the Utley Test has a large number of items which are non-functional. There can be no doubt that the film could be shortened without apparent effect to the results since 50% of the test contributed only 3% to the scores. This would make the test easier to administer, involve less time for the administration and, for the testee, ease the strain of a long period of concentration on the uninteresting series of words, sentences and stories. Similarly, if the advantage of situational clues and generally easier items is offered, better differentiation can be made of the subject's lipreading ability. That this is possible is evident from Tables 6, 7, and 8. Of the 94 items having difficulty indices equal to or greater than the median value of .12, only 14 had discriminatory powers less than .205, which is the median of the point biserial correlation coefficients. It can be seen that those items which have low difficulty indices also tend to be the ones with small discriminating powers. Conversely, the easier items are the ones that discriminate more sharply. The replacement by more suitable items of those which can be answered by only relatively few people might result in a more valid and operationally efficient instrument.

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Development Of Social Skills As An Instrument In Speech Therapy

Jane Beasley

WE HAVE BEEN confronted for some time in the field of speech therapy with three questions: How can we help the child gain new patterns of speech? How can we guide him to use those patterns outside of speech class? How can we aid him in retaining the gains he has made? The search for more effective therapeutic procedures led first to the use of conversational-speech patterns as clinical material (*3*). This meant that from the very beginning of therapy a child practiced sounds as an integral part of phrases he used frequently.

Further experience and study showed that the mere practice on speech patterns still did not enable many children to use them readily in interpersonal situations. Since it is generally recognized that a child's competence in carrying out with relative ease and appropriateness the most common conventional patterns in school and family life influences the way he is accepted by others and the ways he in turn can accept them, it is apparent that all children need guidance in engaging constructively in interpersonal relationships (*8*). This is particularly true of those with disordered speech who often have had limited social experience and even less experience using speech as one form of social interaction. This led to exploration of the possibilities for using as the core of clinical teaching whole situations rather than merely the speech patterns which occur in them (7). The degree of adequacy with which a child takes part in these social interactions has been termed social skills. It is conceived of broadly as the things a child does when he makes a request, goes on an errand, gives or follows suggestions, expresses an opinion, acknowledges a gift, makes or accepts an apology, etc.

This article proposes to present the advantages of utilizing social skills as an instrument in therapy and specific ways in which they can be adapted for meeting individual needs.

Structuring a lesson around development of social skills can serve three useful purposes. *For one thing, it provides a way of working on the mechanics of speech production.* Traditionally there has been a tendency to assume that proficiency in speech was a prerequisite for use, that drill on isolated elements should precede work on actual patterns of speech. There is now evidence to suggest that children learn more readily when the skill they are struggling to acquire is associated with some real doing right from the beginning (*4, 6*). It is true that special work on single sounds needs to be done in many cases in this type of

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teaching as in others, but the ways in which it is done are significant. Work on a [v] sound, for instance, is not done for a period of time in isolation, then incorporated in syllable combinations as the next step preparatory to use in a word, then in a phrase; but the sound is embedded in context at the outset. A child may begin by working on the [v] sound in a request, as 'May I have it?' The whole pattern is used first so the child gets an overall concept of the use of such a request as it refers to a set of four or five small toys on a table. The pattern is then scrutinized carefully as it is said slowly; then just the 'have it' is practiced, then the [v] by itself, if necessary. Then it is put back into the whole pattern, the pattern is used again in the situation even though the particular child may still need careful guidance in incorporating the [v] adequately. The order followed is whole-part-whole. Many children who show a delay in learning to produce a sound normally nevertheless are developing some awareness of where the sound occurs in various patterns, and are experiencing use in such a way as to encourage them to keep working toward improvement since the practice has meaning for them. This one sound [v] could be incorporated in various speech patterns, as 'May I have it?' 'Will you have it?' 'How many do I have?' 'What do you have?' Such patterns the child has occasion to use in the process of learning about appropriate ways of exchanging toys, making requests, guessing, asking and answering questions. There is a wealth of practice material to be found in these procedures geared toward development of social skills.

Secondly, development of such skills within a real situation can be used to guide the child in carrying out with relative ease the most common conventional behavior patterns in our culture. Ability to behave in an accepted way not only makes it more possible for him to get along in his society, but it facilitates learning in the clinical situation as well as transfer of such learning into speaking events outside the speech class. Take, for example, the boy who wanted desperately to be liked by others but succeeded only in alienating himself through behavior characterized by tripping, pulling hair, and making fun of others. Because the therapist had been creating an atmosphere in which the group talked frankly about problems, she could bring up this problem for discussion (*1, 9*). It was introduced casually in connection with the general topic of things that are liked in the behavior of others. The assumption was made, not that the child was 'bad' or was a 'disciplinary problem,' but that here was something he had not learned to handle, that there were others with some difficulty also, and that the group should work to help each other solve such problems (*5*). Children and therapist listed ways in which it is possible to show another person that he is liked, e.g., saving a chair, choosing him for an activity sometimes, inviting him to go along to get a drink at the fountain, etc. Then such behavior was practiced in the group. This kind of procedure serves to reduce social pressures for the child and creates more acceptance and favorable response from other people.

Thirdly, class activities growing out of the use of social skills make it possible to recognize how a child perceives himself in relation to his surroundings, to what extent he feels liked, confident, independent, to what extent he has poor perceptions of his own worth, strong needs for attention,

excessive anxieties, fears, hostilities (2). These class activities also provide an instrument for changing the child's functional organization so that he is more ready to learn, more able to cope with reality. For instance, a child whose speech behavior is characterized by multiple sound omissions and substitutions may be clinging to infantile speech as a protection against competition with an older brother, competition which he feels incapable of handling. The child's sense of inadequacy must be changed along with his speech if improvement is to be made and retained. Drill on sounds alone has been shown to be unprofitable if the child feels too deeply that he cannot measure up to the older brother. Procedures emphasizing taking part in an activity, choosing, being chosen, giving and carrying out a direction, exchanging compliments, and welcoming guests afford numerous chances for giving the child a growing sense of his own abilities not so possible in a class geared only to practice on sounds where the tendency often is to focus chiefly on the child's shortcomings.

Structuring a lesson around development of social skills is consistent with modern scientific knowledge concerning the dynamics of human behavior (*10*). Certain applications of this knowledge have been implied in the foregoing discussion indicating that the second and third problems in therapy commonly thought of as separate steps, e.g., transference, permanence, are actually part and parcel of the first step, acquisition of skill. If a child is to show optimum growth in respect to his speech behavior, there needs to be recognition of a child's readiness for learning, concern with modifying his behavior so that he is able to profit from training. There needs to be awareness that learning is non-additive, proceeding from whole to parts. It is also believed that learning takes place more readily in the present situation where a child is actually engaging in experience real to him, experiences closely resembling other events in which he participates.

The speech therapist may well ask, 'What implications does this have for me in my teaching? Where shall I begin? How can I apply this orientation when I have a large case load and see the children for only a limited time each week?' A description of one group lesson and one child's progress will serve to clarify answers to such questions.

The lesson described shows procedures used with one group of children who had been participating in speech therapy for two half-hour classes weekly over a three-month period. It illustrates the use of social skills as the core of the teaching situation. This particular lesson is concerned with helping the children handle an occurrence fairly common in speech class, one requiring particular use of speech, and providing practice on sound elements.

Jack, a third grade boy who came to speech class, had developed patterns of taking what he wanted, employing force if necessary. He would grab a chair away from another child when entering the room, snatch materials before they could be distributed, seize personal possessions of other children. It was soon evident to the therapist that forces in this child's environment were hostile to him. The other children avoided him, did not choose him for turns, reacted unfavorably to most of his actions, jealously protected their possessions from him although they shared them with others. From evidence gathered through observing Jack over a period of several weeks in

various situations and talking with his mother, it appeared that the boy's behavior indicated the presence of many insecurities affected by and affecting his speech.

Within the framework of speech class, the therapist had a responsibility to the child greater than that of teaching him new patterns of speech. She also had a unique opportunity to help him with speech as a means of changing his perceptions of himself and altering reactions toward him.

A start was made in the context of a lesson on apologies. The children discussed occurrences which warranted apologies, such as bumping into someone in the hall, banging a door, taking a chair already belonging to another. They talked about their feelings when having to apologize or when an apology was made to them. They listed possible things to say, and pointed out particular sounds to check themselves on in such patterns as the following: 'I'm sorry I bumped into you. I didn't see you there,' or 'I think you have my chair.' Suggested replies included, 'That's all right. I didn't see you either,' or 'I'm sorry, I didn't know that,' or 'I know it. I was fooling you.'

The children then re-enacted the situations as taking another's chair, and used the pattern listed above. Jack listened and watched, then volunteered to take another's chair but give it up when asked. This he did several times in the three lessons on apologies, much to the surprise of the group. His possession of their chairs was not new to them; his relinquishing them was. It gave the teacher an opportunity to praise him for this new behavior and suggest to him that he could probably get a chair and keep it in the same way, by asking. She pointed out his ability to use the [θ] and [v] in the first part of the pattern. He then went to each person in the group of eight saying, 'I think you have my chair,' and the child gave it to him. He experienced, perhaps for the first time, a new acceptance of himself in the group in addition to some satisfaction in producing speech within normal range. At a later time he was given help in what to do if a child preferred not to give him the chair. Similar speech patterns were used in ensuing lessons in requesting materials rather than grabbing for them, or by asking to see a toy object belonging to another child. The group members became aware of ways in which they could be of assistance. As Jack reverted one day to his old pattern of grabbing for a yo-yo a boy had, the boy pushed it deep in his own pocket, and smilingly said, 'I'll let you try it if you ask me first,' which Jack did.

This brief account by no means represents the complete story of Jack. Many more weeks of carefully planned social experience in speech class were required before the boy began showing more positive signs of accepting and being accepted by the group, greater confidence in his own abilities, willingness to gain desired ends through more socially approved channels than formerly, noticeable improvement in speech.

This account represents current direction and investigation of teaching procedures utilizing the development of social skills as an instrument in speech therapy.

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The Institute Of Logopedics: Its Physical Plant

Martin F. Palmer

(Editor's note: The following article was written at the invitation of the Editor. The new physical plant of the Institute of Logopedics represents a unique plan for the housing and supervision of children during their attendance at a speech correction center. It was felt that a description would provide useful and interesting administrative, organizational, and construction ideas.)

General purpose of the Institute. The Institute was organized in 1934 primarily as a professional training school in speech and hearing disorders, with a clinical and research program closely integrated with, but subservient to the major goal.

General organizational structure. The professional training aspects of the Institute are conducted by means of an arrangement with the University of Wichita and the Department of Logopedics of the College of Education. All courses in logopedics are taught at the Institute, however, and all members of the department are members of the Institute's staff, as well as of the staff of the University.

The clinical and research programs are under the direct control and administration of the Institute of Logopedics, a non-profit corporation operated by a Board of Trustees elected annually by the members of the Corporation.

The Institute of Logopedics functions also as a holding corporation, owning all of the non-dividend bearing stock of two other non-profit corporations: The Logopedics Development Corporation, which owns and manages the physical plant of the Institute, and the Kansas Unit, Institute of Logopedics, which does business with public agencies, the latter being required under Kansas statutes.

The physical plant. The physical plant of the Institute of Logopedics (Figure 1) is located on a tract of 40 acres in the Northeast section of Wichita one-half mile from the campus of the University of Wichita. It is easily accessible by automobile and public transportation and is about three miles from the central business district of Wichita. The present building structures occupy 30 of the 40 acres. The remaining 10 acres are at present being utilized for recreational and vocational training. The land is a long, narrow strip, one-eighth mile wide on the frontage, and one-half mile long, lying North and South, for the best wind exposure.

There are 41 buildings, arranged in an attempt to avoid an institutional atmosphere, and to present the appearance of a 'village.'

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Cottage apartments. The apartment buildings were located with the following objectives in mind: 1. Convenient access to the administrative and clinical building; 2. Maximum play area per unit of building. 3. Avoidance of traffic hazards.

Thirty of the apartments lie on each side of a two-block mall leading from the main entrance to the grounds to the clinic building. These apartment buildings are grouped in threes around central play areas, and additional recreational space is provided in the rear of the courts.

Ten of the apartment buildings lie enclosed in a street loop to the rear of the clinic building, and form a quadrangle about a recreational area occupying the approximate space of a city block. This group of buildings was planned with the physically handicapped in mind, so that no traffic ways are crossed.

Each apartment building contains four apartments, making 160 living units in the village. Each apartment has two bedroms, kitchen, living and dining room combination and bath. In addition, basements provide recreational and storage space.

These apartments were designed to serve two purposes: 1. The care of not more than three cases by an individual housemother; 2. Individual occupancy by parents who might wish to care for their own children on the grounds. Both plans provide for 24-hour supervisory programs by the Institute.

None of the apartments have special fittings for the physically handicapped, since it was felt that these individuals should learn to operate standard doors and bathroom fixtures. The interiors, however, have been planned for maximum ease of care by the housemother. All front entrances are reached by ramps; all rear entrances by steps. The ramps are not for the convenience of the cases, but for the convenience of the house-

FIGURE 1. Aerial view of the Institute of Logopedics.

mothers handling wheel chair cases.

All cooking is done in the apartments. Food is disbursed on physician's recommendations from a Central Commissary. This permits vitamin control, as well as diet, and is actually economically feasible.

Nurses are on duty for emergencies full time. Housemothers are selected on the basis of psychological testing and interview, and must take a course of training lectures.

Administration and clinic building. The administration and clinic building is located in the exact center of the property. It is approximately 40 by 180 feet, and is the only two story building on the grounds. Like the rest of the architecture, it is brick and semi-colonial in style. All three floors are utilized, connected by stairs and an automatic, hydraulic elevator.

The building is completely fireproof, and is engineered on the first and second floors with all of the weight thrust on the outside walls, so that all partitions in the building are temporary, and are not integral portions of the structure. The concrete floors have conduits poured in them for all utilities, which can easily be reached in case of remodelling. Heating in the winter and cooling in the summer is carried out by Carrier equipment, utilizing an 85-ton compressor in the summer time. The equipment is guaranteed to hold a temperature of 70 degrees regardless of the outside air temperature summer and winter. It is a forced air system, with automatic blending of external air at all times.

Interior floors are covered with asphalt tile, except in the basement. Partition structures are of painted pumice block. Plaster was used only in the lavatories. The sound transmission characteristics of pumice block are not satisfactory although reverberation noise is satisfactorily absorbed, giving the impression of a very quiet building.

The basement contains the Occupational Therapy department, the Vocational Education department with manual and power tools, the Physical Therapy department, a classroom, a complete photographic laboratory, and the cafeteria for staff, students, and such cases as may wish to eat there.

The first floor contains the Hearing Clinic quarters, physician's offices, administrative offices, two classrooms for special education for the cerebral palsied, and clinic rooms.

The second floor contains research quarters with electronic and other equipment, clinical rooms, offices, and classrooms for aphasics and the deaf.

The clinical rooms are approximately 10 by 15 feet. They are arranged in pairs, and the interior hall corner has been removed from each room, so that observatory 'triangles' rather than 'cubicles' are achieved. These are closed off from the hall by means of Modern Fold doors, and permit observation of cases through one-way mirrors.

Decoration of the building is in green, and wall decorations are held to a minimum. In the children's classrooms, the Occupational Therapy department, and in the cafeteria appropriate murals have been painted. Clinical rooms, however, have been purposely kept non-distractive.

All of the building is connected by inter-office communication from the main PBX switchboard.

General remarks. The planning has

proved to be very satisfactory. Clinical progress has increased in this plant over the former quarters. The buildings have been in use since September, 1949. The cost of operating this plant and the general program now amounts to approximately $600,000.00 per year. The buildings were built under an FHA loan from the Equitable Life Assurance Society, the original mortgage being $1,399,000.00. This amount is being reduced steadily.

While good professional work can be done without adequate building structures, ease of performance is certainly increased when the structure is planned from the first for the use to which it is put.

An Objective Approach To The Investigation Of Social Adjustment Of Male Stutterers

Duane C. Spriestersbach

THIS STUDY involved an attempt to formulate and test a procedure for investigating certain human evaluative reactions. Stutterers, non-stuttering university students, and mental hospital patients with confirmed psychotic diagnoses were used as subjects.

Briefly, the procedure devised for purposes of this study required the subject to rate each of a series of pictures with respect to its appropriateness as an example of the meaning of a specified word. Each picture represented one or more persons engaged in some sort of activity. For example, one of the words used in the test was *worthwhile*, and as one part of the procedure the subject was instructed to rate each of 15 pictures as an example of people engaged in worthwhile activity. A 7-point scale was used. A rating of 1 indicated that the activity pictured was, for the subject, as extremely poor example of what he would mean by *worthwhile;* a rating of 7 indicated that it was an extremely good example of what he would mean by the word. The intervening scale values were used by the subject to designate intermediate degrees of appropriateness. Eleven different words were employed, and for each word there were 15 pictures to be rated.

The basic objective of the study was to determine in a standardized and quantitative fashion the character of certain evaluative reactions which could reasonably be expected to function more or less significantly in relation to the individual's social adjustments. This approach to the general problem of social adjustment involves two fundamental assumptions. The first is that an individual's social adjustments are affected by his degree of social conformity with respect to the evaluative reactions displayed in the test situation. The second is that evaluative reactions, having the assumed adjustive significance, can be elicited by a procedure which requires the individual to employ value judgments in rating, or evaluating, pictures of behavior more or less representative of the culture patterns to which he is commonly required to make adjustments. The test of these assumptions must be empirical. That is, their acceptability depends upon the degree

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to which any test, constructed on the basis of them, proves effective in differentiating individuals and groups who differ with respect to social adjustment, as determined independently of the test in question. The present study was designed to provide such an empirical test of the assumptions. The university students were regarded as being representative of at least one variety of culturally acceptable social adjustment, and the psychotic patients were regarded as representative of one kind of social maladjustment. The degree to which the test differentiated these two groups may be viewed, therefore, as an empirical basis for judging the practical usefulness of the assumptions involved in the testing procedure.

The use of the stutterers as the third group of subjects represented an attempt to make a practical application of the test, within the limitations of its degree of validity as determined by the operations described above. That is, assuming that the test does differentiate between the evaluative behavior of university students and psychotic patients, and evaluative behavior of the stutterers on the test can then be discussed meaningfully in terms of any differences found between the behavior of the university students and the psychotic patients.

Some preliminary work had been done which suggested the basic design used in this investigation. Moore (*4*), Gallant (*2*), Knocke (*3*), and France (*1*) used the Johnson Word-Fact Relating Test to study such language factors as extensional agreement (vagueness of factual reference), synonymity (overlap in extensionally defining a pair of terms) and word-fact relating conformance (the individual's conformance to a group in defining a word extensionally). The original test used by the above investigators consisted of 20 pictures and 20 words. The words used were *good, bad, worthwhile, fun, unfair, un-American, wrong, right, stupid, intelligent, most artistic, interesting, sensible, like most, like least, immature, respectable, working, playing,* and *immoral.* For example, the subject was asked to point to all the pictures in the group of 20 which showed people doing *good* things, then to all the pictures showing people doing *bad* things, etc.

The above investigators demonstrated that such a technique could be used with a wide range of subjects and that a highly reliable test could be constructed without impractical difficulty. Certain refinements of the essential procedure appeared possible, however, and these were undertaken in the present investigation.

Construction of the Test

Selection of Terms. Having assumed that evaluative reactions can be elicited by having the individual use selected words to rate pictures of behavior representative of the culture patterns to which he must make adjustments, the first step in the experimental design was the selection of terms which would be generally expressive of socially significant value judgments. Since the scale's effectiveness would be influenced to some degree by the success achieved in obtaining a wide range of pictorial examples of the various words to be scaled, words were selected which, it was felt, would also meet this criterion. Thirteen words were chosen: *bad, childish, foolish, fun, funny, good, interesting, peculiar, undesirable, unpleasant, wholesome, work,* and *worthwhile.*

Selection of Pictures. Once the words to be used in the scale had been selected it was necessary to select a set of pictures for each word which would extensionally define the word with varying degrees of appropriateness. Approximately two years of *Life*, *Look* and *Coronet* were searched, and 54 black-and-white pictures were selected from these sources. Each picture had one dominant point of interest concerning the behavior of people. A caption was then written for each picture to try to insure that all judges and subjects viewing a given picture would notice the same aspects of the picture. From 13 to 17 male upperclassmen and graduate students at the University of Iowa acted as judges to determine which pictures were relevant as examples of each word, and then to rate each of the relevant pictures on a 7-point scale. If a given picture was judged to be one of the best possible examples of the meaning of the word being scaled the picture was given a rating of 7; if the picture was judged to be one of the worst possible examples it was given a rating of 1; if it was regarded as a fair example it was given a rating of 4, etc.

The medians and *Q*'s of the ratings were computed for each of the 54 pictures as an example of the meaning of each word. Fifteen pictures whose medians encompassed comparatively extensive proportions of the scale range, whose *Q*'s were relatively small, and for each of which there was preferably not more than one judgment of non-relevance made by the group of judges, were selected to be rated by the subjects as examples of the meaning of each word.

It should be noted here that the word *funny* was treated somewhat differently. A series of 27 cartoons taken from *The Saturday Evening Post* were rated as examples of *funny*. On the basis of the judges' ratings, 15 cartoons were selected as meeting the same criteria described above for the selection of the pictures.

A study of the judges' ratings revealed that so many judgments of non-relevancy were given to the entire series of pictures when they were being scaled as examples of *bad* and *childish* that it was questionable whether or not enough relevant pictures remained to present an adequate choice for the final scale. These two words were eliminated, therefore, leaving 11 words for each of which there were 15 pictures.

Testing Procedures

The 15 pictures to be rated as examples of the meaning of a given word were presented as a group to the subject. The essential instructions given the subject were these:

> You are going to look at 11 groups of pictures. Each group will have a word above it. You are to judge each picture as an example of the meaning of this word. In order to do this you will rate each picture.
>
> This is the rating scale you will use: [A graphic rating-scale was shown here, with the numbers 1 through 7 placed thereon, under each of which was a description of the meaning of the numerical rating, as follows: 1, One of the worst possible examples; 2, Very poor example; 3, Poor example; 4, Fair example; 5, Good example; 6, Very good example; 7, One of the best possible examples. This graphic rating-scale was reproduced at the top of each of the rating blanks used by the subjects.]
>
> If you feel that a picture is one of the best possible examples of the meaning of the word that appears above it, you should give the picture a rating of 7. If you feel that a picture is one of the worst possible examples of the meaning of the word that appears above it, you should give that picture a rating of 1.

If you feel that the picture is a fair example of the meaning of the word that appears above it, you should give the picture a rating of 4, etc. You are to rate the pictures according to your understanding of the meaning of the word which appears above the pictures. For that reason there are obviously no right or wrong answers. There are no limitations on the number of 1's, 7's, 3's, 5's, etc., which you can give to any series of pictures. If you feel that an entire series of pictures represents some of the best possible examples of the meaning of a given word, you should rate them all 7's, etc.

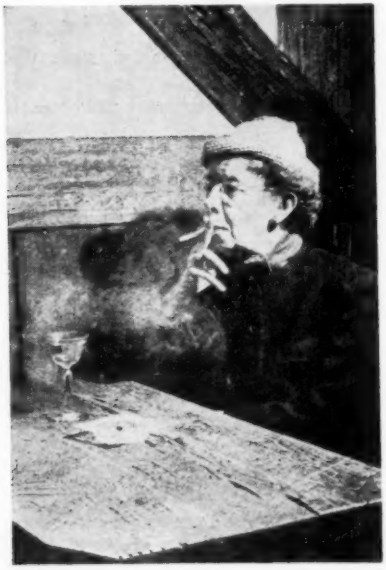

FIGURE 1. Picture rated as an example of *good*. (Reproduced with permission of *Look*.) Caption: Woman Having a Drink and a Smoke in a Bar.

	Median Rating	*Q*
Normal Males	2.14	.81
Stutterers	2.44	.72
Psychotics	3.70	.89

Median differences significant at the 5% level of confidence: Stutterers/Psychotics; Normal Males/Psychotics.

Subjects

The subjects tested consisted of 183 normally-speaking males enrolled at the State University of Iowa, 50 male stutterers enrolled in the speech clinics at the State University of Iowa and the University of Minnesota, and 20 male psychotic patients in the Mt. Pleasant, Iowa, State Hospital. The median age of the normal males was 20.5 years, of the stutterers 21.5 years, and of the psychotic patients 47 years. The paramount considerations in the selection of the psychotic patients were the patients' state of mental deterioration and their general cooperativeness. Within these limitations it was attempted to select patients whose intelligence and educational levels were as similar as possible to those of the normal males and the stutterers. Twelve of the patients had finished the eighth grade, five had finished high school, and three were college graduates.

Results

Ratings of the Pictures. Each of the subjects rated each of the 165 pictures in the test. Figures 1 and 2 are presented as a sample of the series of 15 pictures which were rated as examples of people doing *good* things. The data presented beneath the pictures are formally typical of the data obtained for the other 163 pictures.

Test - Retest Agreement. Approximately one week after the initial tests, 40 of the normal subjects were retested. The scale differences between the two ratings of each picture by each of 40 subjects was computed. For 10 of the 11 words at least 50% of the judgments made during the second rating were exactly the same as those made the first time. Further, for

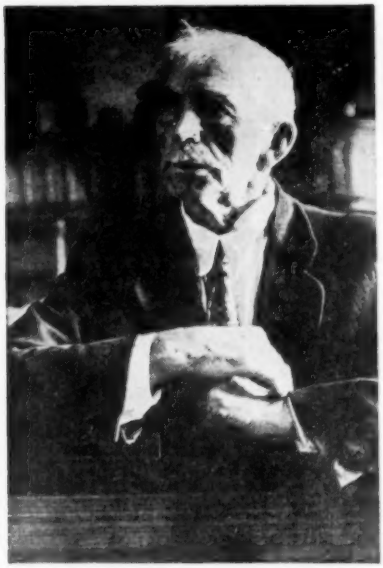

FIGURE 2. Picture rated as an example of *good*. (Reproduced with permission of Lucien Aigner.) Caption: Man Attending Church.

	Median Rating	*Q*
Normal Males	6.57	.61
Stutterers	6.13	.88
Psychotics	5.50	.92

Median differences significant at the 5% level of confidence: Normal Males/Psychotics.

the 11 words at least 90% of the ratings on the second administration did not exceed a difference greater than one scale point in either direction from the original rating. It was therefore felt that the ratings made at different times were sufficiently stable to warrant the use of a given set of ratings as indicative of the characteristic response of the individual tested.

Analysis of the Data. Two major analyses of the data were made. First, the median rating was computed for each picture for each of the three groups of subjects. Table 1 shows the number of pictures for which differences between median ratings of compared groups of subjects were significant at the 1% and 5% levels of confidence, respectively. It should be noted that out of 165 pictures, approximately two pictures at the 1% level of confidence and 8 pictures at the 5% level of confidence could be expected to be rated significantly differently by chance when the ratings of any two groups are compared. It can be seen that, while the stutterers differed from the normal males in the ratings of only slightly more pictures than could be attributed to chance, both the normal males and stutterers differed significantly from the psychotic patients in the ratings of at least six times the number of pictures that could be attributed to chance.

The second major analysis of the data was made with reference to what was called 'the total deviation score.'

TABLE 1. The number of pictures for which differences between median ratings of compared groups of subjects were significant at the 1% and 5% levels of confidence, respectively.* N, each comparison, 165.

	1%	5%
Normal Males vs Stutterers	3	10
Normal Males vs Psychotics	38	60
Stutterers vs Psychotics	28	48

* Number of significant differences in rating in each comparison required to reject the null hypothesis: 1% level, 3; 5% level, 9.

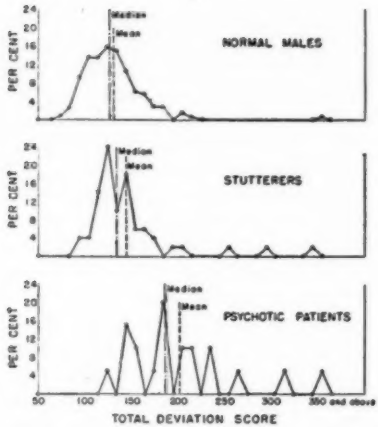

FIGURE 3. A comparison of the distributions of total deviation scores of the normal males, stutterers and psychotic patients, the interval frequency in each case being expressed as a percentage of the N of the respective group.

This score was computed for each subject by summing absolutely, i.e., without regard to sign, the differences between the individual's ratings of the 165 pictures and the median ratings of the normal males for all pictures.

Figure 3 presents in graphical form the total deviation scores for each group. While it is probable that some of the irregularities of the curves, particularly those of the stutterers and psychotic patients, would be smoothed out by an increase in size of sample, it would appear warranted to assume that the form of the ultimate curve of the psychotic patients would differ significantly from those of the other two groups.

The mean total deviation score of the stutterers was significantly different from the mean total deviation score of the normal males at the 5% level of confidence only. The difference between the mean total deviation score of the normal males and that of the psychotic patients was significant at the 1% level of confidence, as was the difference between the mean total deviation score of the stutterers and that of the psychotic patients. These differences were interpreted as indicating that the evaluative behavior of the stutterers resembles that of the normal males more than that of the psychotic patients.

TABLE 2. Percentage of stutterers and psychotic patients whose total deviation scores fall within certain percentile limits of the normal male total deviation scores.

Percentile Limits	*Range of Total Deviation Scores for Normal Males which Fall within the Indicated Percentile Limits*	*Percentage of Individuals in the Groups Indicated Falling Within the Various Percentile Limits*	
		Stutterers	*Psychotics*
90.1-100.0	166.70 and above	16	70
80.1- 90.0	149.68-166.69	10	10
70.1- 80.0	140.53-149.67	18	15
60.1- 70.0	132.26-140.52	6	
50.1- 60.0	128.72-132.25	12	5
40.1- 50.0	120.41-128.71	16	
30.1- 40.0	113.16-120.40	8	
20.1- 30.0	105.88-113.15	8	
10.1- 20.0	97.82-105.87	2	
0.0- 10.0	97.81 and below	4	

A percentile table was prepared for the total deviation scores of the normal males. Table 2 shows the percentages of individuals of the stuttering and psychotic groups, respectively, which fall within certain percentile limits computed on the basis of the total deviation scores of the normal males. It can be readily seen that, while there is relatively slight tendency for the total deviation scores of the stutterers to drift toward the higher percentile ranges, there is a marked tendency for the score of the psychotic patients to do so. In fact, the total deviation scores of 95% of the psychotic patients fall at or above the 70th percentile.

Discussion

Since the purpose of this essentially exploratory study was to investigate the usefulness of the described technique as a testing device and to try out a practical application of the technique, rigid control of the composition of the sample populations was not enforced. As a consequence, the obtained results can be discussed only in relatively general terms.

Examination of Figure 3 shows that the size of the sample of psychotic patients and, to a lesser degree, the size of the sample of stutterers and normal males needs to be enlarged before smooth curves of the distributions of the total deviation scores of the groups can be obtained. Only then can more definitive statements be made pertaining to the differences in the tested evaluative behavior of the groups studied.

Further, it will be noted that the age and, to a lesser degree, the educational background of the psychotic patients vary markedly from those of the stutterers and normal males. While a preliminary study of the effects of age within the normal male group indicated that the extreme age groups did not differ significantly in their evaluative behavior, it is felt that the wide diversity which did exist between the three groups with respect to age and educational background may have introduced results which cloud the real differences between the psychotic patients and the other two groups.

The age and educational background of the stutterers approached those of the normal males more closely than did those of the psychotic patients. The stuttering group, however, was composed of individuals who varied markedly in stuttering severity. Moreover, some of these subjects had only begun clinical work on their speech, while others had undergone considerable counseling and treatment. Needless to say, the significant social adjustment problems confronting the individuals in the stuttering group varied from few, if any, to many.

No attempt was made to control the socio-economic level of the groups. From casual observation it would appear safe to say that the psychotic patients as a group were from a considerably lower socio-economic level than were the normal males and stutterers. If it is assumed, as seems reasonable on the basis of surveys in other behavior areas, that different socio-economic levels are characterized by different evaluative behavior, then the lack of control of this factor is to be taken duly into account.

Another limitation of the study may be found in the fact that the responses to certain words and pictures which failed to differentiate between any

of the groups have been included in the results. A survey of the significance ratios obtained when the median ratings of the three groups for the 165 pictures were compared indicates that 65 pictures were not rated significantly differently by any two groups. This can probably be accounted for to a great extent by the fact that the usual evaluations of those particular activities in our culture are so widespread as to characterize the majority of the members of the various groups. No pictures were eliminated at this stage of the research, particularly because the sample of psychotic patients was not adequate for purposes of final evaluation of individual pictures in this sense. Meanwhile, the inclusion of non-differentiating items can only serve to increase the possibility that irrelevant chance factors may affect the extent of the obtained group differences. The best pictures would appear to be those which, while relevant as examples of a certain word, elicit varied rather than restricted responses from the various subjects.

Conclusions

With due regard for the limitations to generalization that must be observed on the basis of the present data, the general findings with respect to the stuttering group may be summarized in the following statement: Insofar as the test employed measures a basic aspect of social adjustment, the stutterers investigated displayed evaluative reactions deviating from those of presumably normal non-stutterers to an extent suggestive of relatively mild degrees of social maladjustment. The stutterers differed markedly, on the other hand, from the psychotic patients in their evaluative reactions.

The factors of age and mental ability, insofar as it was possible to study them in this experiment, did not appear to be significant determiners of the deviation scores of the normal males.

The results obtained appear to justify the assumptions upon which the test design was based. Further research is needed, however, before the test can be considered sufficiently refined for general use. The influence of such factors as age, sex, intelligence, educational background, and socio-economic level on the test scores is yet to be ascertained by means of appropriately designed investigation.

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The Effect Of Speech Training On Silent Reading Achievement

Morris Val Jones

THE GOAL of this study was to determine whether there is a relationship between speech and reading. The author, employing an active rather than a passive approach to the problem, gave third-grade pupils a series of 36 speech lessons over a period of one semester. In one aspect, at least, the study differed from almost all the previous research on the relationship of speech and reading in that the subjects were neither speech defectives nor reading retardation cases. They were average third-grade pupils as found in any elementary school. In setting up the study, the question to which an answer was sought was, 'Will speech training, given to normal third-grade pupils, accelerate their silent reading achievement?'

Theoretical Background

Since research in speech has, for the most part, ignored the relationships between speech and reading, research on reading must be turned to for the theoretical basis of the problem. Seemingly, the authorities in reading agree that speech training, or at least proficiency in speech production, is important for its own sake. The majority of them believes that a significant relationship exists between speech and reading, but a minority contends that the relationship is significant only when the speech is deviant. Even then, this minority argues, reading retardation is not caused by the speech defect itself, but by the concomitants of the defect, such as embarrassment, shyness, or self-consciousness. Many experts in reading, including well-known authors like Betts (*1*), Hildreth (*6*), Dolch (*2*), and Durrell (*3*), champion the position that reading proficiency is conditioned by facility in speech. As Betts (*1*) has conservatively expressed their viewpoint, 'Since speech and reading are facets of language, speech patterns contribute to or impede the development of reading ability.'

The experiment here reported was based on the theory of the sequential development of language as promoted by Betts (*1*). According to his theory, there are six steps through which the child must pass on his route to language proficiency. The first of these is experience with objects. During the second stage, hearing comprehension, the child learns to differentiate speech noises made in relation to him. Next he learns to produce speech. After these first three steps, which

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normally occur before he enters school, the child encounters the fourth stage of language development, reading. He now discovers that meaning exists in the relationship between written or printed symbols and experience. The fifth and sixth stages—writing and refinement of language control—are not concerned in the present investigation.

Crucial to Betts' theory and germane to the present study are the assertions that language growth during one stage contributes to readiness for the next stage and that language growth is promoted as control is extended over successive facets of language. In other words, it is significant that stage four, reading, is dependent upon the development of stage three, spoken language. Greater facility in oral language, according to this theory, will be reflected in a more successful mastery of reading and writing. Other writers who have expostulated the same idea include Hildreth (7):

> The child's command of speech largely controls his initial success as well as his ultimate development in reading . . . Since oral language is acquired by the normal child before reading is begun, any lag or aberration in speech development tends to affect progress in reading.

A study of the etiology of speech defects and of reading disabilities leads one to theorize that a relationship between speech and reading does in reality exist. Even a cursory examination of the literature highlights the fact that both speech and reading have many factors in common. A partial list of similarities may be summarized as follows:

1. Both speech and reading are not basic biological functions, but adaptive functions in which the individual puts his basic biological equipment to use in performing learned activities.

2. Both are complex processes in that they require the ability to associate meanings with symbols and are dependent upon the factor of intelligence.

3. Both presuppose a state of readiness on the part of the individual concerned.

4. Both may be affected by personality or emotional maladjustments and by various environmental factors.

5. Both may be deterred by constitutional and physical factors, such as endocrine imbalances, long illnesses, and malnutrition.

There is, naturally, a close relationship between training in the phonetic principles underlying the English language and the application of these principles to visual material. A change of attitude concerning phonics on the part of experts in reading instruction is evident between the publication of the *Twenty-Fourth Yearbook* in 1925 and the *Thirty-Sixth Yearbook* in 1937 by the National Society for the Study of Education. In the earlier publication there had been an almost total neglect of the oral aspects of language, while in the 1937 *Yearbook* the experts had begun to decry the lack of emphasis upon phonics and oral reading in the reading programs. The trend to re-establish phonics as a legitimate and essential part of reading instruction has continued. Training in auditory perception, especially sound discrimination, has become a major part of the instruction in reading readiness. Auditory, as well as visual, avenues to the child's perceptive apparatus are utilized in all well-rounded reading programs.

Experimental Evidence

Surprisingly enough, very little experimental evidence has been published concerning the relationship of

speech and reading. An examination of Traxler's (*8*, *9*) summaries of experimentation in reading and related fields shows that more than 1,000 studies were published between 1930 and 1945, but that nearly all of them concerned only one of the facets of language and did not cross the almost imperceptible boundaries between them. The few which attempted to establish a relationship between speech and reading dealt with deviant or retarded language development. None of the studies dealt with the effect of speech training upon the silent reading achievement of children with normal speech. Both Gaines (*5*) and Wong (*11*), who wrote reviews of the literature on the subject, which included 14 experimental studies, found that the amount of research has been too restricted either to substantiate or to disprove any assumption that one might wish to make. In most of the studies, they found, also, that the definition of speech defects was vague and that diagnosis varied from the ratings of mothers or other untrained observers to the ratings of a panel of speech specialists. In addition, the use of nonstandardized terminology precluded the possibility of comparing results, and the absence of reliable norms for speech proficiency in the general population further prevented comparisons.

The quality of several studies, published since the reviews by Gaines and Wong, has improved. Five studies were found which concerned themselves in part with the relationship of speech and reading, although all were still largely in the realm of deviant speech or reading. The most recent study and perhaps the most thorough one was conducted by Yedinack (*12*), who concluded from her study of over 100 second-grade pupils that children with functional articulatory defects are significantly inferior in both oral and silent reading to children with normal speaking ability. She stated that the existence of a strong relationship between reading and speech handicaps shows that they result from a common cause or that articulatory defectiveness retards the development of normal reading ability. She recommended that greater emphasis be placed on the training of children in speech vocabulary and oral language usage before instruction in reading is begun.

Procedure

Sixty-one pairs of third-grade pupils from 10 classrooms of the Santa Ana (California) City Schools were matched individually for chronological age, mental age, silent reading achievement, sex and teacher. All the pupils included in the study were normal in vision, auditory acuity, and speech. The Experimental Group and the Control Group were essentially equal in certain home background conditions as evaluated from ratings by their teachers. Sex, grade and teacher, as well as chronological age, could be determined by observation or from the school records. Five variables, then, remained to be measured by testing devices for normality or degree of development. These were auditory acuity, visual acuity, speech production, mental age, and reading achievement.

Hearing acuity was determined by an individual pure-tone audiometer test, while visual acuity was tested with a Snellen Chart and a plus 1. lens. Speech production was tested for an absence of abnormality, as set forth by West, Kennedy and Carr (*10*), by

a qualified speech correctionist. He used the Bryngelson-Glaspey picture test for isolated words and a personal interview for connected speech. Mental age was based on the scores obtained by the pupils on the California Test of Mental Maturity, Primary Series, and reading achievement on the scores from the Gates Advanced Primary Reading Test.

The three most important variables in the study were mental age, chronological age, and silent reading achievement. According to statistical analysis, there were no significant differences between the means of the two groups on these three variables at the beginning of the study. All children in both groups were normal in visual acuity (20/20 vision), in auditory acuity (no loss greater than 15 db in either ear within the speech range), and in speech (as determined by the speech correctionist). Differences between the two groups in terms of certain home conditions, such as marital status, economic status, and sibling relationship, were not statistically significant.

The members of the Experimental Group were taken from their regular classrooms for a series of 36 speech improvement lessons, each half an hour in length. Meanwhile, members of the Control Group remained in the classrooms and received instruction in social science or mathematics. Schedules were carefully regulated so that the members of each of the 61 pairs were given the same instruction in reading and speech in the classrooms.

The speech instruction included in the lessons was that which would normally be used in a well-planned speech curriculum. The lessons were intended to develop the speech sound discrimination, the skill in speech production, and some aspects of personality of the members of the speech classes. Since the author believes that such personality development is a by-product of well-planned speech activities, no direct attack was made on personality problems within the material or methodology of the lessons. Efforts were made, however, to build up the self-confidence of the pupils by giving them opportunities to lead the group in discussions and in choral speaking.

Appreciation for good speech and for worth-while literature was also a part of the plan in setting up the lessons of the study. The teacher attempted to present a correct speech model for the pupils and to encourage them to comment favorably upon the improved speech of their classmates. The materials for the lessons were chosen in terms of their value as worthy representations of children's literature.

The first 25 lessons were built around the consonant sounds of the English language; for example, one lesson stressed the [m] sound, another [d], another [k], etc. Several lessons, though not all of them, began with exercises for relaxation. A part of each lesson, usually from five to ten minutes, was devoted to an activity requiring attentive listening. Activities to accomplish the goals set forth included choral speaking, speech games, and dramatization of stories and poems. In the last 11 lessons, the pupils listened to a story or poem for the first part of the period and then dramatized it during the last part. The dramatizations included such stories as 'Hot as Summer, Cold as Winter,' 'Rumpelstiltskin,' and 'Johnathan Bing.' The goal was to make each lesson interesting and to create

an atmosphere in which the children would feel free to express themselves orally.

At the beginning of the study and again at the end, the two groups were tested with equated forms of the Gates Advanced Primary Reading Test. Both times the author administered them to the entire enrollment of the 10 classes from which the matched pairs of the experiment were selected. Results from these tests were analyzed to determine whether the Experimental Group made more advance in silent reading during the course of the study than the Control Group.

Results

The data secured indicate that speech training does affect positively the silent reading achievement of third-grade pupils. Statistical analysis of the data reveals that:

1. The difference in the means of the two groups in silent reading achievement had a *t*-ratio of 2.82, which is significant beyond the 1% level.

2. The increase of the Experimental Group over the Control Group in paragraph comprehension had a *t*-ratio of 2.24 (significant at the 3% level), while the increase in word recognition had a *t*-ratio of 2.13 (significant at the 4% level).

3. The boys were, as a group, six-tenths of one grade below the girls in silent reading achievement at the beginning and at the end of the study. This difference had a *t*-ratio of 2.98, which is significant beyond the 1% level.

4. In general, the pupils maintained their relative status within their groups during the course of the study. The correlation between the beginning scores and individual gains in terms of grade level improvement (-.10) was not significant.

Implications of the Study

The present study tends to substantiate the fact that speech and reading are closely related aspects of language. Many of the skills taught in a well balanced speech curriculum have carry-over value to the reading process. The literature makes it increasingly evident that speech is being recognized as a necessary part of the school curriculum at all levels. A breaking away from the traditional patterns in education is dependent upon this increased emphasis upon speech education. Various authors, including Fernald (*4*), have criticized an exclusively visual approach to the problems of reading. Reading involves bringing to the printed page meanings which can be built up and emotionally impressed upon the child's memory through speech experiences.

The conscientious teacher of speech, especially in the lower grades, is undoubtedly teaching important reading skills. Fundamental to the program in speech is instruction in attentive listening, methods of observation, and techniques of self-expression. The lessons which were presented to the Experimental Group in this study were designed to develop these attributes. The activities utilized within the lessons were merely means to an end. Only incidental attention was given to the technicalities of choral reading, discussion, and dramatization of stories. In every possible case, the children were asked to think about the implications of the ideas presented in the material, to build up associations between these ideas and their own

experiences, and to present their own ideas on related subjects.

Research on the interrelations among the language arts has been slighted. The relations of speech to the other facets of language and its effect upon them have received almost no attention. Even the research concerning the relationship of speech defects and reading disabilities has been contradictory and inconclusive. The present study, undertaken to establish a relationship between speech training and silent reading achievement at the third-grade level, has resulted in evidence to bolster the belief that improvement in speech facility does accelerate silent reading achievement.

Many areas remain to be more carefully investigated. Among them are the following:

1. The effect of speech training upon silent reading achievement at various grade levels.

2. The interrelation of speech and other facets of language, such as spelling and writing.

3. The relationship of speech defects, such as stuttering or functional articulatory defects, and silent reading achievement.

4. The effect of bi-lingual background on silent reading achievement.

5. The effect of reading instruction upon deviant speech.

6. The effect of speech training in auditory sensitivity upon silent reading achievement, on spelling, and on writing.

7. The effect of speech training upon silent reading achievement when the speech training is correlated with the classroom instruction of the pupils.

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The Remission Of Athetotic Shoulder Tremors Through The Use Of Non-Musical Sound Stimuli

Lyda M. Schmeling

THE CURRENT USE of music and sound stimuli in many hitherto unexplored ways, especially as therapeutic measures for specific abnormal neurological or psychotic conditions, is receiving widespread attention. The utilization of such therapy in the retraining of the large group of cerebral palsied individuals—and of athetotics in particular—poses one of the most controversial issues in the field of logopedics.

In an experiment by Palmer and Zerbe (*12*), the subject, a young adult cerebral palsied male exhibiting a typical athetotic tremor of the right index finger, was subjected to a series of 126 experiments. The stimuli, which were chiefly auditory, produced an increase and subsequent control of the rate, stability, and intensity of the tremor. Remission of the tremor, for considerable lengths of time following cessation of the stimuli, occurred after control of the tremor had been effected.

The results obtained by Palmer and Zerbe were in direct opposition to the majority of the few statements found in the literature. Other writers, including Lord (*10*), Donaldson (*4*), Myers (*11*) and Carlson (*3*), refer, for the most part, to the relaxing, soothing, or distracting effects which are observed with musical therapy. Altshuler's (*1*) observations based on his large-scale application of musical therapy in the treatment of the mentally ill are pertinent. The tendency to produce cortical functions and voluntary movements through thalamic pathways in time with music or sound stimuli under neurological conditions which would make the written or spoken word ineffective is of importance in the study of athetosis. Although kymographic tracings of athetotic muscles have been published by Klingman and Carlson (*9*), and electromyographic tracings of athetotic muscles by Hertz (7), Palmer and Zerbe (*12*) have published the only long-time kymographic tracing study of athetosis. A survey of the literature discloses no evidence of either kymographic or electromyographic studies of the complex athetotic shoulder.

Purpose

It was the purpose of the present study to determine the effectiveness of non-musical sound stimuli upon the athetotic tremors of the shoudler girdle muscles as shown by (1) an increase in the amplitude of the tremors with subsequent remission of the tremors following cessation of the sound

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stimuli and (2) to demonstrate a practical clinical application of the experimental procedures.

Many factors have contributed to the difficulty of making adequate controlled studies in this field. The logopedist, eager to secure the most progress and limited in time, finds it impossible to set up a controlled experimental situation for each retraining period. Again, there has often been a dearth of specially designed apparatus to record the results of the clinical procedures and to aid in the evaluation of such procedures. In the present study, this factor was especially pertinent.

The development of more objective and more adequate techniques for the retraining of cerebral palsied persons is a clinical necessity. A solution to this problem lies in the innovation of experimental techniques which can be utilized as practical clinical devices.

The Subject

The subject, a 28-year-old cerebral palsied male, examined in May, 1937, exhibited severe athetosis in both the upper and lower extremities, as well as in the neck, head, and breathing musculatures. The right arm was withered and there were extremely severe constant tremors of the right shoulder girdle musculature.

According to Hoefer and Putnam (*8*), irregular simultaneous motor unit discharges to antagonist muscles resulting in vermiform movements and tremor are found in athetosis. Thus, there is an almost constant simultaneous innervation of agonists and antagonists. The subject of this study exhibited symptoms conforming to the classical illustrations of athetosis as described by Hertz (7), Best and Taylor (*2*), Fulton (*5*), Grinker (*6*), and in other sources in the literature, thus allowing for no reasonable question of the diagnosis of athetosis.

Apparatus

One of the most difficult problems confronted in this study was the invention of a machine to graph the patterns of athetotic shoulder tremors. The shoulder joint and accessory structures, the acromio and sternoclavicular joint, involve a complex group of 16 muscles. After considerable study a mechanism, which graphed the tremors via the Cartesian coordinate system,[1] was constructed.[2]

The experimental apparatus consisted of six units: (1) *The Tremor Transmitting Mechanism* allowed for the transmission of movement through the use of three valves set up to correspond to respective planes. The stimuli occurred automatically or through manual manipulation of the switches at the initiation of movement in selected directions. (2) *The Shoulder Harness* of sailcloth was attached to a circular tin disk fitting over the sailcloth. Bolted to this disk were heavy aluminum angles to which was connected a pin leading to a shaft passed through a pivot. A ball set firmly on

[1]The Cartesian coordinate system allows for the graphing of movement in three mutually perpendicular planes having as their origin a fixed point; the origin was, in this study, the position of the shoulder at rest. Up and down movements of the shoulder were graphed in the z + and − directions, respectively, backward and forward movements in the y − and + directions, respectively, and shoulder abduction and adduction on the x − and + directions, respectively. Inadequacy of the apparatus did not allow for the segregation of tremors into + and − directions as originally planned. Therefore, tremor-axes relationships only are considered in the data.

[2]The author was assisted in this part of the study by George F. Schmeling, Jr., who constructed the apparatus used.

the other end of the shaft in contact with the three surfaces of the valves transmitted the shoulder movement. (3) *The Switchboard* was connected to a complex circuit system with controls which allowed for stimuli to be automatically presented and recorded with movements in one or more of the six directions. The stimuli also could be controlled manually through a key, or in the case of the bell, by means of a button attached to the switchboard. (4) *The Stimuli Apparatus* allowed for three kinds of stimuli: (a) Single-stroke bells, one connecting with the tremor-transmitting mechanism and the other operated by a button on the switchboard. (b) A high-frequency oscillator which could be adjusted within unknown limits. (c) A gong—produced by a wooden mallet striking a wooden drum-like surface. (5) *The Needle-Aligning Mechanism* made it possible to align the needles quickly and accurately by means of a plumb line and a small level attached to the turntable. The graphing needles of the kymograph were attached to a rod inserted in a turntable. (6) *The Miller Kymograph* with the standard equipment, five needles, including three needles for graphing shoulder tremors in the three axes, was used. The other needles graphed the periods of production of the stimuli at the time. A 1/5-second timer was used through most of the experimental series for the records which were approximately six minutes in length. During the later experimental periods when longer—approximately 20-minute—records were run, it was necessary to use a one-second timer.

Procedure

The subject was seated in a curved-back chair. A screen obscured his vision of the switchboard, operator, and recording styli. He was strapped into the chair and the shoulder tremors were graphed by means of the apparati described previously. The stimuli, in chronological order as used in the experimental series, consisted of: (1) single-stroke bells, (2) high-frequency oscillator, and (3) gong. The experiments were conducted in a sound-proofed room. On all controlled experiment days the only persons present, in addition to the subject, were the author and an observer.[3]

Outlines were prepared in advance of each experiment day. When results indicated their advisability, however, innovations were introduced into the day's procedure and recorded as part of the regular experimental series.

It was possible to run four records each experiment day throughout most of the series; three records per day were run on two experiment days, and on two days only two records were made. In all cases, the subject had a rest period of approximately 30 minutes between the second and third runs if more than two records were made that day.

Results

The tremors of the shoulder girdle muscles were graphed via the Cartesian coordinate system in the x, y, and z axes. As previously noted, the stimuli were not musical and produced instantly loud sounds giving definite auditory shocks. These stimuli were of the same nature as those of the second experimental series, the Martele series, of Palmer and Zerbe (*12*).

Table 1 shows the seriatim position of administration of stimuli and num-

[3]Following the seventh experiment day, a demonstration experiment under uncontrolled conditions was made. The results, however, are excluded from the data of this series.

TABLE 1. Seriatim position of types and mode of administration of stimuli with number of experimental and control periods.

Exp. Day	*Record*	*Stimuli*	*Administration of Stimuli*				*Total Exp.*	*Control*
			Automatic			*Manual*		
			x	*y*	*z*	*z*		
1	1	Bell	2	1	2		5	4
	2	"	2	2			4	5
	3	"	2	2	1		5	6
	4	"	1	2	1		5	5
2	1	"	1	1	1		4	3
	2	"		3		2	5	5
	3	"	2	2			4	4
	4	"		2	2	1	5	5
3	1	H.F.O.*			3	1	4	4
	2	"	2	1	1	1	5	3
	3	"			2	2	4	4
4	1	"	1		1	1	5	4
	2	"			2	1	5	3
	3	"			3		3	4
	4	"	1	1			3	4
5	1	Hammer			2	2	4	5
	2	"			4	2	6	5
	3	"			3			
		H.F.O.			3	1	7	8
	4	Hammer			2			
		H.F.O.			3		5	5
6	1	Hammer			4	1	5	5
	2	"			3			
		H.F.O.			1	1	5	5
	3	Hammer			3	1	4	5
	4	"			5	1	6	4
7	1	"			3	3	6	6
	2	"			1	3	4	5
	3	"			1	4	5	4
	4	"			1	3	4	4
8	1	"						
	2	"						
9	1	"						
	2	"						
	3	"						
10	1	"						
	2	"						

*High frequency oscillator.

ber of experimental and control periods by days and records. Control periods refer to those in which no sound stimuli were administered. The table should be read as follows: Figures under Automatic Administration of Stimuli indicate the number of experimental periods in which the stimuli occurred with the initiation of each movement in the direction indicated; figures under Manual Administration of Stimuli indicate the number of ex-

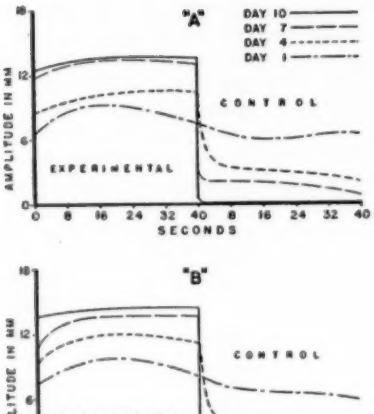

FIGURE 1. Representative patterns of tremors in the *x*-axis. A, first half of daily experimental series; B, second half of daily experimental series. Curves for experimental and control periods set in 40-second patterns.

perimental periods in which the stimuli were aimed at control of tremor in the *z* axis;[4] under Control are shown the number of control periods following and preceding the experimental periods.

Distribution of experimental and control periods of the last seven records run on the final three experiment days are not given. These records were characterized by lengthy remission periods, such remissions were prolonged for the maximum desirable periods under the experimental conditions.

The 10 experiment days extended over a period of 16 days with an average of 3.4 records being run each day; on each record were graphed several experimental and control periods. Twenty-nine six-minute records were run the first seven experiment days for a total of 174 minutes. The last seven 20-minute records totaled 140 minutes. The entire experimental series included nearly 300 experimental and control periods. The records were analyzed for amplitudes of the tremors.[5] A longitudinal survey or tremor amplitudes was presented graphically in the original thesis. The prohibitive length of such data precludes presentation here.

Figures 1, 2, and 3 show representative tremor patterns of days 1, 4, 7, and 10 of the experimental series. Each

[4]Early in the experimental series it was cursorily noted that tremors in the *z* axis were most consistent in rate and amplitudes; all manually administered stimuli throughout the series were based on these tremors.

[5]Further analyses of tremor rate and intimate relationships of tremors in the three axes are now in progress.

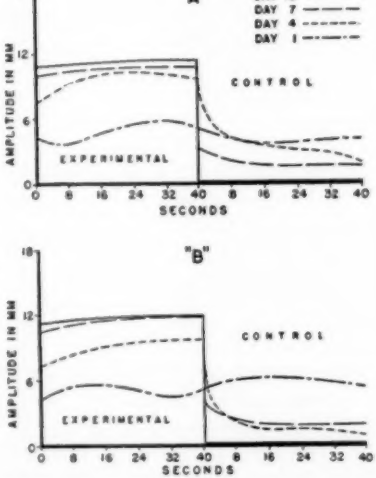

FIGURE 2. Representative patterns of tremors in the *y*-axis. A, first half of daily experimental series; B, second half of daily experimental series. Curves for experimental and control periods set in 40-second patterns.

curve represents one-half of the number of experimental and control periods graphed in the axis indicated on the day shown (the control and experimental periods graphed on one, one and one-half, or two records–see Table 1 which gives the number of records run each day).

The curves for experimental and control periods are set in 40-second patterns. A ratio is observed: on days 1, 4 and 7 each curve represents 12 minutes; on day 10 the curves represent 20 minutes. Ratios concerning number of experimental and control periods were figured on a similar basis of total number of periods each day. Thus, the curves graphed are typical of changes occurring in the tremor patterns as the experimental series progressed rather than detailed reports of exact amplitudes at specific seconds of specific periods.

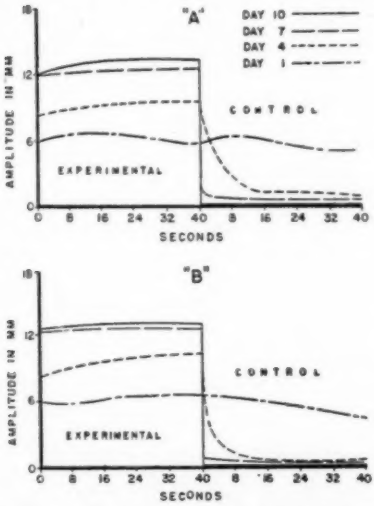

FIGURE 3. Representative patterns of tremors in the z-axis. A, first half of daily experimental series; B, second half of daily experimental series. Curves for experimental and control periods set in 40-second patterns.

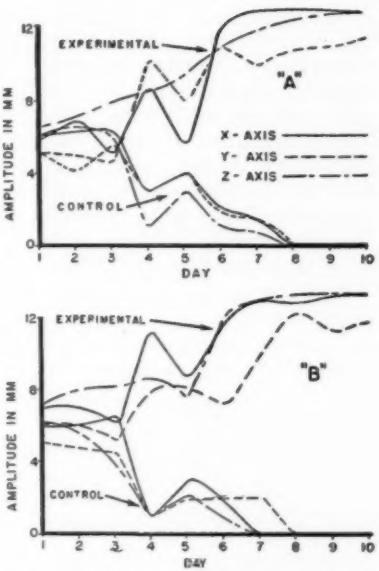

FIGURE 4. Average amplitude of tremors in the three axes on the 10 experimental days. A, samples from the first record of the day; B, samples from the last record of the day.

Comparison of the first and second halves of the daily experimental series shows that successful experimental and control periods are skewed toward the end of each daily experiment. It is shown that successful experimental (with increased, consistent tremor amplitudes) and control periods (with remission of tremor) occur more frequently on days 7 and 10 than days 1 and 4. Tremor amplitudes were increased in the three axes as the experimental series progressed. Tremors in the *y* axis showed the least and *x* axis tremors the most increase. Amplitude increases parallel the consistency of tremor amplitudes at the beginning of the experimental series in the respective axes.

Samples of experimental and control periods from the first and last records

of each experimental day were analyzed for tremor amplitudes in the three axes and the axis in which the initial tremors of the control period occurred were noted. In each case, the samples are representative of the daily experimental series. For example, for days in which complete remissions of tremors throughout the control periods were infrequent, a sample showing no remission was selected.

Figure 4 shows the average amplitudes of tremors in the three axes on the 10 experimental days. A samples are from the first record of the day and B samples are from the last records of the day.

The three types of stimuli were introduced on days 1, 3, and 5. Periods of those days show fluctuations in the experimental series pattern of both the experimental and control periods.

The validity of exact comparisons of tremor amplitudes in the three axes is doubtful. The air conduction system and recording apparatus made exact recording of amplitude impossible. Such inaccuracy does not apply to the complete remission periods—0 on the graphs—and the amplitudes of the smaller tremors were recorded more accurately than those of the larger tremors whose amplitudes were minimized. Sample findings substantiate those of the representative patterns of the experimental series (Figures 1, 2, and 3).

Table 2 shows the time in seconds of the experimental and control periods graphed in Figure 4, and the dis-

TABLE 2. Sample analysis: Time in seconds of control and experimental periods; complete remissions of tremors distributed by axes; initial tremors of control periods.

Exp. Day	*Sample*	*Time in seconds*		*Remissions throughout Con. Per.*			*Initial Tremor*
		Exp. Per.	*Con. Per.*	*x-axis*	*y-axis*	*z-axis*	
1	A	52.2	37.0				z
	B	55.0	46.2				z
2	A	56.3	35.0				z
	B	56.8	41.7				z
3	A	95.0	56.0				z
	B	49.8	79.0				z
4	A	66.4	51.0				z
	B	64.0	58.0				z
5	A	52.8	51.0				z
	B	61.6	32.0				z
6	A	29.0	44.5				z
	B	46.1	43.3				z
7	A	71.2	59.4				z
	B	34.6	33.4	+			z
8	A	29.5	39.0	+		+	y
	B	22.5	33.0	+	+	•	z
9	A	42.0	71.0	+	+	•	z
	B	46.3	56.5	+	+	•	z
10	A	42.0	74.0	+	+	•	z
	B	36.0	120.0	+	+	+	

•Slight respiratory-like curves less than 1.0 mm. in height.

tribution and samples of periods in which complete remissions of tremors extending throughout the control periods in one or more axes occurred. Axes in which the initial tremors of each control period occurred are indicated under Initial Tremor. No complete remission periods are shown for the six days. Complete remissions in one or more axes are recorded in the second sample of the seventh day and in each of the succeeding samples of the experimental series.

The average length of control periods was 50.45 seconds and of experimental periods was 47.6 seconds. The slight movements graphed in the *z* axis in A or B samples of control periods of experiment days 8, 9 and 10 resembled typical respiratory curves and were distinctly unlike the curves seen in any of the foregoing control periods. If complete remission periods shown in Sample A, Day 8, and Sample B, Day 10, are the result of tension athetosis or a vagary of the athetotic distribution, the absence of such remissions in the earlier part of the series is remarkable.

Complete remissions in the *x* axis are shown in each of the final seven samples. Five remissions in the *y* axis are seen. Whereas four remission periods occurred in the *x* and three in the *y* axis in B samples, only three and two such periods are shown in the *x* and *y* axes, respectively, A samples. One complete remission in the *z* axis was found in an A Sample, the other in a B Sample.

Summary and Conclusions

A young adult cerebral palsied male exhibiting severe athetotic tremors of the right shoulder girdle was subjected to a series of nearly 300 experimental and control periods. Three types of non-musical sound stimuli patterned after the Martele series of Palmer and Zerbe (*12*) were used. A mechanism constructed to transmit the athetotic tremors of the shoulder-girdle muscles graphed the movements via the Cartesian coordinate system in *x*, *y*, and *z* axes. As the experimental series progressed, tremors in the three axes were increased in amplitude; cessation of stimuli produced complete remissions of tremors on one or more axes extending throughout the control periods.

The findings of Palmer and Zerbe (*12*) concerning the control of athetotic tremors by sound stimuli were substantiated in the present study. Remission from athetotic tremors were causally related to the experimental techniques; the investigator was able to retain remissions of tremors only after producing an increase in the amplitudes of the tremors.

The third stimulus, the hammer, was most effective in securing increased tremor amplitude and, following cessation of the stimulus, tremor remission. This effect may have been due to seriatim position with reference to possible effects of learning or conditioning factors rather than the type of stimulus.

Experimental and control periods occurring later in the daily experimental series were more successful than the first periods of the day; the foregoing finding, as well as the 'innoviation' effect seen, confirm the Palmer and Zerbe (*12*) findings.

The stimuli corresponded to or were aimed at control of tremors in the *z* axis throughout the middle and final stages of the experimental series. Although *z* axis tremors increased most in amplitude and showed most consistent remission of tremors except for the previously cited respiratory

movements graphed; the stimuli were effective in producing control and remission of x and y axis tremors also. The late appearance of these curves was presumably due to the masking of such curves by the athetotic tremors.

Initial tremors following experimental periods occurred most frequently in the z axis but were followed by tremors in other areas. If movements in the z axis could have been eliminated, the periods of complete remission in the other axes may have been prolonged.

The experimental apparatus did not allow for the delineation of tremors in the individual muscles involved. Electromyographic recordings of such tremors would be of value. The presence of respiratory curves in the z axis indicates the need for further study of the relationship of respiratory movements and tremors in the shoulder girdle area of the athetotic subject.

Sound stimuli similar to the experimental stimuli are readily available in most clinical situations. The utilization of sound stimuli in retraining the athetotic should not be overlooked.

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A Study Of Minor Organic Deviations In 'Functional' Disorders Of Articulation: 4. The Teeth And Hard Palate

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Mary Van Horn Lintner

The present article reports a portion of the results of an investigation which has attempted to provide preliminary answers to two questions: Are there organic differences between persons with 'functional' articulatory disorders, as ordinarily classified, and persons without disorders? If so, what are some of the specific differences?

The first report of the series (*4*) included a discussion of the problem and a detailed description of the methods employed in selecting the subjects, 60 young adults who constituted the following four groups: 15 males and 15 females with superior consonant articulation; 15 males and 15 females with inferior consonant articulation. Selection was at random from the extremes of articulatory ability, as determined by screening and testing; all 'organic' and certain 'functional' types of speech disorders were excluded. Subjects were brought into the laboratory individually for a number of measurements and estimates of (1) the rate of movement of oral structures, (2) the lips, (3) the tongue, (4) the teeth and hard palate, and (5) hearing. The results, too lengthy for a single article, are presented in a series corresponding to these five divisions, with summarization and interpretation reserved for the final paper. The first three divisions have already been reported (*2, 3, 4*).

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Procedure

The present division was concerned with certain measurements and estimates. Three dimensions of the hard palate, corresponding to those of Fymbo (*5*), were measured as follows: (1) Cuspid width, the transverse diameter between the lingual surfaces of the cuspids at the highest points of the gum lines; (2) molar width, the transverse diameter between the lingual surfaces of the first molars at the highest points of the gum lines above the prominences of the mesio-lingual cusps; (3) palatal height, the midline vertical distance from the plane of the occlusal surfaces of the first molars to the hard palate. An additional measurement was made of the maximum mouth opening, defined as the midline distance between the cutting edges of the central incisors with the mandible maximally depressed.

The measurements of cuspid width and molar width were made with an orthodontic micrometer,[1] and their reliability was evaluated by measuring 30 young adults twice on successive days. Rank-difference correlation co-

[1]Blue Island Specialty Co., Inc., Blue Island, Ill.

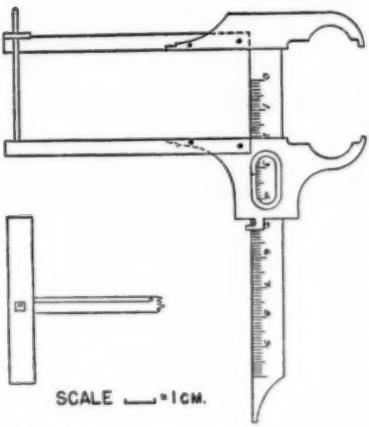

FIGURE 1. Palatometer.

efficients between the sets of repeated measurements were .91 and .97 for cuspid and molar widths, respectively.

For the measurement of palatal height the palatometer shown in Figure 1 was constructed. A Boley gauge was modified by lengthening the two straight arms 55 mm by means of bars. A transverse plate, approximately 9×55 mm, was mounted on the end of the fixed upper bar. From the end of the movable lower bar a 45 mm rod extended upward through a hole in the transverse plate. In measurement the transverse plate is placed against the occlusal surfaces of the upper first molars, and the upper fixed bar against the upper incisors in the midline, these three points establishing the zero plane. The lowest bar is then elevated until the rod touches the hard palate. Palatal height is read from the scale by subtracting the obtained value from 40 mm, that constant being the scale read-

TABLE 1. Measurements of the dental arch and of maximum mouth opening. Means, standard deviations, and differences. All values in millimeters. Four basic groups of 15 subjects each.

Measure			*Superior*	*Inferior*	*Difference**
Cuspid Width	Male	AM	24.67	24.20	0.47
		SD	3.11	1.83	
	Female	AM	23.87	23.67	0.20
		SD	1.59	1.49	
Molar Width	Male	AM	36.40	34.53	1.87
		SD	3.12	4.55	
	Female	AM	33.07	32.80	0.27
		SD	2.67	1.47	
Palatal Height	Male	AM	21.33	22.67	−1.34
		SD	2.09	2.91	
	Female	AM	19.87	20.27	−0.40
		SD	2.31	2.05	
Maximum Mouth Opening	Male	AM	53.33	57.33	−4.00
		SD	4.68	5.45	
	Female	AM	50.20	52.40	−2.20
		SD	6.30	5.19	

*Superior - Inferior

TABLE 2. Analysis of variance. Values in millimeters.

Measure		*Between Groups**	*Ability**	*Sex**	*Interaction**	*Within Groups**
Cuspid Width	*v*	2.87	1.66	6.66	0.28	4.76
	F†	0.60	0.35	1.40	0.06	
Molar Width	*v*	40.98	17.06	86.26	19.61	10.66
	F	3.84	1.60	8.09	1.84	
Palatal Height	*v*	23.53	11.26	56.06	3.28	5.99
	F	3.93	1.88	9.36	0.55	
Maximum Mouth Opening	*v*	133.44	144.14	244.01	12.16	31.66
	F	4.22	4.55	7.71	0.38	

* *df*: Between Groups, 3
Ability, Sex, Interaction, 1
Within Groups, 56
† *F* = Given Variance/Within Groups Variance
F, 3 & 55: 1%, 4.16; 5%, 2.78
1 & 55: 1%, 7.12; 5%, 4.02

ing at zero height.[2] Reliability was examined as above; the coefficient was .88.

Maximum mouth opening was measured with a Boley gauge, the subject being instructed to open his mouth as far as possible. The largest value obtained in three successive trials was used. Reliability was studied in the same manner with a rank-difference coefficient of .94.

The teeth of each subject were examined and judged in four general respects: (1) Molar occlusion, employing the normal reference defined by Angle (*1*), in which the antero-lateral cusp of the upper first molar is aligned with the buccal groove of the lower first molar; (2) occlusion of the upper and lower anterior teeth in both antero-posterior and infero-superior planes; (3) alignment of the individual upper and lower incisors and cuspids; (4) spaces (failures of proximal contact) anterior to the bicuspids, both upper and lower. Each of these four items was rated on a Normal-Slight-Marked deviation scale, and described by the use of certain sub-categories which will appear below. In this instance reliability was estimated by having one experimenter repeat the examinations and judgments on two successive days with 60 young adults. Self-agreement percentages for the above four items, including their subdivisions, were 87, 83, 80, and 93, respectively.

Results

Measurements. Means and standard deviations are shown in Table 1 and the results of analysis of variance in Table 2. For the three palatal dimensions the means are similar to those of Fymbo (*5*) and the differences between sexes are in the usual direction. The differences between ability groups, sex constant, are minor, and

[2] In Figure 1 the palatometer is shown at approximately 8 mm. For measurements of the smaller oral cavities of children a 9 × 35 mm transverse plate and a 25 mm vertical rod are substituted.

study of Table 2 will show that they are not significant. In cuspid width all *F* ratios are very small. For molar width and palatal height the ratios of the first column exceed the 5% level, but the second and third columns show that the differences are attributable to sex and not to ability. There is, in other words, no basis for abandoning the hypothesis that in palatal dimensions young adults with inferior consonant articulation, as defined in this experiment, do not differ from those with superior articulation.

In maximum mouth opening the findings are dubiously positive. The *F* ratios in the first three columns of Table 2, the second of which is for ability, exceed the tabled 1%, 5%, and 1% values, respectively. Differences between basic ability group means in Table 1, however, do not exceed the minimum of 4.12 required at the 5% level. In Table 1 it will be seen that the means of the inferior groups are larger than those of the superior group in both sexes. This finding is not readily interpreted, since there is no obvious direct connection between size of mouth opening and articulatory ability, unless it be in the opposite direction. The latter hypothesis, in fact, was the reason for including the item. The most likely explanation seems to be that the larger means of the inferior subjects were produced by higher incidence and severity of openbite and overjet. Some support for this speculation is given by the results shown in Table 6 below, although the data there permit no definite conclusion.

Estimates. The general results of the dental examinations are presented in Table 3, which shows the distributions of judgments for each of the four main items, and, in parentheses, the ratings of degree of severity of deviations when present. For this section the sex groups were combined into two ability groups of 30 subjects each.

Study of Table 3 discloses that the groups appear to differ in molar and anterior occlusion, but not in anterior alignment and spaces. Tests of significance,[3] however, provided no evidence of anything but chance differences and further analysis was not made of these items as such.

The cases then were divided into two categories: (1) Those judged to be normal or to have only slight devi-

[3]Significance of the difference between two proportions, as in McNemar (6), pp. 75-77, and Snedecor (7), pp. 431-440.

TABLE 3. Estimates of occlusion. Combined ability groups of 30 subjects each.

Rating	*Molar Occlusion*		*Anterior Occlusion*		*Anterior Alignment*		*Anterior Spaces*	
	Sup.	*Inf.*	*Sup.*	*Inf.*	*Sup.*	*Inf.*	*Sup.*	*Inf.*
No Deviation	19	14	12	7	17	16	15	16
Deviation	11	16	18	23	13	14	15	14
(Slight)	(7)	(11)	(17)	(8)	(9)	(6)	(8)	(3)
(Marked)	(4)	(5)	(1)	(15)	(4)	(8)	(7)	(11)

TABLE 4. Relative incidence of marked dental deviations. Categories: No marked deviation in any respect; one or more marked deviations in molar occlusion, anterior occlusion, anterior alignment, or anterior spaces. Combined ability groups of 30 subjects each.

	Superior	*Inferior*
No Marked Deviation	20	9
One or More Marked Deviations	10	21
(One)	(5)	(10)
(Two)	(4)	(5)
(Three)	(1)	(5)
(Four)	(0)	(1)

ation in *all four* of the general items, and (2) those with *one or more* marked deviations. The distributions are shown in the two upper rows of Table 4. The difference is substantial and significant at the 1% level. The conclusion is reached that marked dental deviations are more numerous among persons with so-called 'functional' disorders of consonant articulation than among those with superior articulation. The parenthetical portions of Table 4 are sub-distributions of the second category and are seen to be consistent with the above interpretation. Thus, for example, no superior subject presented marked deviation in all four items, while one inferior subject was so judged; one superior subject and five inferior subjects had three marked deviations; etc.

In Table 5 the subjects are distributed according to class of occlusion.[4] The basic distributions show equal incidence of malocclusion, but the subgroupings in parentheses show a tendency for neutroclusion to predomi-

[4]Normal occlusion implies the molar relationship described above under PROCEDURE plus normal alignment and occlusion of the anterior teeth; in neutroclusion the molar relationship is normal, but there are anterior irregularities; in distoclusion the upper first molar is anterior to its normal position, and in mesioclusion it is posterior (*1*). Each class of malocclusion is subdivided into 'types' on the basis of other attributes, but the data were inconsequential and are not reported.

TABLE 5. Distributions of classes of occlusion. Combined ability groups of 30 subjects each.

Class	*Superior*	*Inferior*
Normal Occlusion	6	6
Malocclusion	24	24
(Neutroclusion)	(13)	(8)
(Distoclusion)	(6)	(10)
(Mesioclusion)	(5)	(6)

TABLE 6. Distributions of anterior occlusion. Combined ability groups of 30 subjects each.

	Superior	*Inferior*
Antero-Posterior Relationships		
Normal	12	12
Overjet or Undershot	18	18
(Overjet)	(18)	(16)
(Undershot)	(0)	(2)
Infero-Superior Relationships		
Normal	26	16
Openbite or Closebite	4	14
(Openbite)	(0)	(9)
(Closebite)	(4)	(5)

nate in the superior group, while distoclusion and mesioclusion are more frequent among the inferior subjects. Since the latter classes are ordinarily regarded as more serious dental problems than neutroclusion, this is in plausible agreement with the findings presented above, but the difference between the distributions is not statistically significant.

The occlusion between the upper and lower anterior teeth in the region of the incisors and cuspids was studied by distributing the subjects as in Table 6. The two groups are seen to be alike in the antero-posterior relationships, but to differ in the infero-superior relationships in the direction of higher incidence of openbite or closebite among the inferior subjects. This difference is significant at the 1% level. The parenthetical breakdown shows that its primary source is openbite.

Summary

This study, involving measurements and estimates of the teeth and hard palate, is the fourth portion of an investigation of minor organic factors in articulatory ability which compared extreme groups. The following were the major findings:

1. In dimensions of the dental arch and hard palate (width and height) statistically significant differences related to ability were not found. Sex differences in molar width and in height were significant.

2. In molar occlusion, anterior occlusion, anterior alignment, or anterior spaces the ability levels did not differ significantly in total numbers of slight or marked deviations from normal.

3. Marked dental deviations were significantly more numerous among the inferior subjects.

4. In number of atypical antero-posterior relationships of the upper and lower anterior teeth (overjet or undershot conditions) the ability levels did not differ significantly.

5. Atypical infero-superior relationships in the same region (openbite or closebite) were significantly more numerous in the inferior group, openbite being the greater factor in the difference.

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A Bibliography On Aphasia

Ralph R. Leutenegger

THIS BIBLIOGRAPHY is a collection of reasonably accessible publications dating from 1864 to March, 1951. The section on unpublished theses and dissertations extends only through the year 1949. Since the compiler's chief interest was the speech and hearing problems of aphasics, the areas of visual aphasias (word blindness), acalculia, agraphia, amusia, etc., are omitted. The listings have been confined to publications in the English language.

Several related readings in such fields as neurology, physiology, psychology, etc., are included. No attempt has been made, however, to exhaust these sources.

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Book Reviews

JOHNSON, WENDELL, ed. *Speech Problems of Children: A Guide to Care and Correction.* Prepared for the National Society for Crippled Children and Adults, by the American Speech and Hearing Association. New York: Grune and Stratton, 1950. Pp. 265. $3.75.

The stated objective of the editor and his associates in this book has been 'to produce a dependable book of interest and value to parents, teachers, social workers, physicians and others who are not professional speech correctionists, but who are nevertheless concerned, of necessity, with the speech handicapped.'

There are 11 chapters in all, each by a different author. Of these, the first is a survey of the general subject of speech disorders in children; the second and third deal with speech difficulties within the framework of the home and the school, and each of the remaining eight discusses one type of speech problem. The eight topics are: functional disorders of articulation, delayed speech, cleft palate and cleft lip, cerebral palsied speech, voice disorders, hesitant speech, foreign dialect, and impaired hearing.

In addition to the editor and 15 contributors there were 21 consultants and six editorial advisors participating in this project. This imposing team of 43 persons, all of them top-flight persons of established reputation, do a highly creditable job in speaking for the National Society for Crippled Children and Adults and the American Speech and Hearing Association, and through them, for the body of professional speech and hearing therapists of this country. Throughout, emphasis has been put on areas of agreement. The reader is repeatedly impressed by the success the writers and editors have achieved in covering essential points while avoiding the alternative dangers of generality and vagueness at one extreme, and excessive detail with inevitable entrance into areas of controversy and divided opinion at the other.

The book is not, and was not intended to be, a handbook for clinicians. The main concern is to present in non-technical language basic information about the most common sorts of speech and hearing problems that require attention in young children. But the book will undoubtedly be read with great interest, and profit as well, by professional speech and hearing therapists. The interest will stem from the desire to see how well their colleagues, the contributors to this book, have managed to present their area of professional concern to the public. The profit will come from the usefulness of these brief chapters (the longest, Backus's 41 pages on cleft palate; the shortest, Duncan's 9 pages on foreign dialect; the average, 26 pages) as authoritative and lucid reviews of basic principles.

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WEPMAN, JOSEPH M. *Recovery from Aphasia.* New York: Ronald Press Co., 1951. Pp. 276. $4.50.

Written primarily for the aphasia therapist, this book is directed also to the relatives of aphasia patients and to the clinical psychologist, the physician, the nurse, and others who may contribute to the rehabilitation of aphasic persons. It is essentially practical in orientation. Dr. Wepman has drawn upon his own clinical experience gained at the University of Chicago and in the Army Aphasia Center at Dewitt General Hospital, Auburn, California.

Recovery from Aphasia is intended by the author's statement to answer four general questions about aphasia: (1) What is known about the disorder? (2) Is the disorder amenable to therapy? (3) What groups should be interested in aphasia therapy? (4) What does the recovery process encompass? The answers to these questions are presented in 14 chapters grouped into three parts which discuss *The Nature of Aphasia, Research Findings During World War II,* and *Aphasia Therapy and Therapists.*

In dealing with the first question the author has attempted the difficult task of

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Book Reviews is edited by Kenneth Scott Wood, University of Oregon.

condensing into fairly brief and understandable form the main theories concerning aphasia. The second part, which presents research findings on the effects of training for aphasics, advances proof that significant improvement does occur as a result of special training. The results of the study also indicate a definite advantage in favor of those patients for whom training was commenced prior to the end of the first post-traumatic year. This section has value but ignores many considerations essential to a complete evaluation of the patient's progress.

The main contribution of the book is in the chapters dealing with therapy for aphasic persons. Here the reader will find valuable suggestions for therapeutic procedures which bear an obvious stamp of clinical validation. Such practical considerations are presented as what to do if the patient has a convulsion, the first interview with the patient, testing procedures to use, the role of the nurse in helping during the early stages of the illness, what aberrations of behavior to expect from the patient, how to go about the early stages of language training; these and many more appropriate topics are discussed in clear, readable form.

Concrete suggestions are made for the professional therapist in dealing with special handicaps of the patient. Throughout, Dr. Wepman emphasizes the viewpoint that the problems of the aphasic person are often not restricted to those of language alone, but that they involve his perception of himself, the world about him, his goals, his place in the family, and the generalized intellectual and emotional effects of his disability. In this section it is unfortunate that the apparent emphasis on 'individual' rather than 'individualized' therapy tends to obscure the advantages of a combination of individual and group instruction.

A book on the subject of rehabilitation procedures for aphasic persons has long been needed. This volume goes far toward satisfying this need. It shows real comprehension of the problems of the aphasic patient and contains highly practical suggestions for therapy. The book is readable, well edited and attractively printed. It should fill a legitimate place on one's crowded reference shelf and should be widely used as a general textbook in courses dealing with the rehabilitation of aphasics.

H. Harlan Bloomer.
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Wiener, Norbert. *Cybernetics:* or *Control and Communication in the Animal and the Machine.* New York: John Wiley and Sons, 1948. Pp. 194. $3.00.

Wiener, Norbert. *Human Use of Human Beings: Cybernetics and Society.* New York: Houghton-Mifflin Co., 1950. Pp. 241. $3.00.

Cybernetics is the name invented by Wiener for a body of theory which underlies the construction of a certain sort of machine. Not every sort of machine would be a case in point. For example, a clock would not be an embodiment of cybernetic theory, but the governor on a steam-engine would be. Again, neither an ordinary torpedo-gun nor its torpedo would be a cybernetic machine, but what is called a target-seeking missile would be. Wiener speaks often of the 'second industrial revolution.' The intended contrast helps to point up the meaning of *cybernetic.* The first industrial revolution replaced human power by mechanical power. The second industrial revolution replaces power by judgment. A machine is *cybernetic* to the degree that it replaces human beings as a source of judgment, a source of significant decision. The word *cybernetic* is derived from a Greek word meaning 'steersman,' symbol of judgment, of significant decision.

The central term in the vocabulary which Professor Wiener uses to expound *cybernetics* is the term 'feed-back.' If a machine or a process involves feed-back, then that machine or process will be, or will appear to be self-correcting. Suppose a man is running after a bus, intending to overtake it. He begins to lose ground. If he continues at his present rate he will not overtake the bus. He perceives the fact that there is a gap between what he is actually doing and what, given his purposes, he ought to be doing. The perception of this fact causes him to put on a spurt. This is an example of feed-back. His behavior is altered because and only because he perceives a gap between what he is actually doing and what he was supposed to be doing. The perception of this gap is fed back into his behavior and brings about the spurt required to close the gap.

In human affairs feed-back is a normal occurrence. When Wiener's 'second industrial revolution' arrives, it will be equally

commonplace in machines, thereby permitting machines to replace humans in respect to the kind of judgment involved in feedback adjustment. As Wiener says, 'For any machine subject to a varied external environment to act effectively it is necessary that information concerning the results of its own action be furnished to it as part of the information on which it must continue to act. . . This control of a machine on the basis of its actual performance rather than its expected performance is known as feed-back.' The *Cybernetics* volume of 1948 is a straight-ahead job. Once you grant the idea of feed-back, and the idea of machines replacing human judgment as well as human power, there is little to boggle at. The book is technical in detail but the technicalities were proper to discourse drawn from the natural sciences and expressed often in language of mathematics.

When, however, you turn from *Cybernetics* to Wiener's later book, *The Human Use of Human Beings*, you find something different. It is a book which any person of ordinary education could be expected to read, and, perhaps, feel that he had a stake in. The author is impressed with the ways in which and the degree to which human beings are, in respect to their 'wiring' and their observable behavior, like machines. But he is jarred when someone suggests that perhaps human beings *are* machines and can therefore be treated as machines. He is impressed with the ways in which and the degree to which human beings can be replaced by cybernetically constructed machines. But he is jarred when someone suggests that since human beings are so replaceable, they therefore be replaced and be regarded as dispensable, at least up to that level of judgment attainable by machines. He is impressed with the ways in which and the degree to which communication, power to give and receive information, lies at the basis of control. But he is jarred when someone, seeing that a monopoly of communication by a group would go a long way to ensure a monopoly of control by that group, proceeds to act on the idea. He is impressed with the ways in which and the degree to which cybernetic mechanisms could be used to alleviate many long-standing human ills, to increase the per capita distribution of more abundant and enjoyable living. But he is jarred when someone, seeing that cybernetic mechanisms can also be used to step up our power of destruction, suggests also that in the present planetary precarium that is their primary value.

In many ways this second book does him credit as a liberal and kind-hearted man. He seems to be appalled and outraged at the suggestion that human beings, no matter how like machines, be treated as machines. He is appalled and outraged that cybernetic machinery might render 'dispensable' those human beings capable only of low orders of judgment and significant decision. He is appalled and outraged when he sees governments, corporations, institutions or other groups monopolizing or distorting any kind of information or communication whatsoever. He is appalled and outraged that inventive resources, capable of extending and deepening the community and happiness of men, be used to extend and deepen the barriers among men, to destroy their happiness, to set them at each other's throats, to enable them to coerce, enslave and obliterate each other.

These sources of 'appall and outrage' lend vigor and clarity and vividness to his writing. When this mood is on him, Wiener's words display a kind of courage and forthrightness which is becoming less common in the public prints in our day. He can refer to 'The Lords of Things as They Are,' and make his references stick. He can refer to 'The Voices of Rigidity' and leave no doubt whom he is talking about or what he thinks about them. He can roar in protest against what he calls 'The Fifth Freedom—the freedom to exploit' and leave no doubt that he would roar in support of the other freedoms.

Here and there, peeping through the terms of his indictments, you catch sight of what might be called presuppositions of his indictments. At this point, I think, you are confronted with philosophy, not cybernetics. It turns out, for example, that there is something, about which it is possible to be seriously wrong-headed, something of the sort that Plato calls 'the good for man qua man.' This is not a cybernetic notion. It turns out further that 'the good for man qua man' is the full development of those powers and capacities that mark man as a rational animal, and of the kinds of community which those powers and capacities make possible. This is not a cybernetic notion. It turns out, still further, that 'man qua man' has a right to this thing which is his 'good,' and a duty to recognize this right in others. This is not a cybernetic notion. Wiener does not, so far as I have been able to discover, talk this way, or anything like this way, about his cybernetic machines, even in his fondest and most speculative

moments. He is, therefore, despite an occasional tendency to emphasize analogies between men and machines, a good humanist. Some articles in the journal, *Philosophy of Science*, suggest that Professor Wiener's good humanism is more instinctive than reflective; but that is another matter.

ALBUREY CASTELL.
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Department of Philosophy

BERGMAN, MOE. *The Audiology Clinic: A Manual for Planning a Clinic for the Rehabilitation of the Acoustically Handicapped.* Stockholm: *Acta Laryngologica*, Monograph 89, 1950. Pp. 107. $1.00. (Copies may be obtained from Audiology Foundation, 1104 S. Wabash Ave., Chicago).

In this monograph the author sought to cover only the more basic elements of the total problem having to do with the establishment of an audiology clinic, and made no effort to include a description of the specific skills which would be inherent in the work of various professional staff members.

Inasmuch as Dr. Bergman is Chief Audiologist of the Audiology Clinic, New York Regional Office, Veterans Administration, he draws to a great extent from the experience of that organization in presenting his material for clinic planning. As far as possible the organization of an 'ideal' audiology clinic is described with the recognition that only those workers in the field with the most affluent sponsors would be able to realize such a program in its entirety. Having some conception of the 'ideal' organization, however, an aspiring clinical unit could scale down the specifications to fit its own peculiar needs and limitations.

Considering that this monograph discusses such widely varied and fairly technical subjects as clinic organization, design, equipment needs, and personnel, the author has done a commendable job of presenting his material in an interesting, logical and easily comprehended style. The fact that the intricacies of the specialized areas were given only general consideration aided in minimizing the complexity.

A praiseworthy aspect of this monograph is its lack of dogmatism. For example, at the point where the author is discussing the architectural planning of a sound-treated room in an audiological unit, he points out that there are many combinations of materials which will result in satisfactory sound attenuation, the use of which is largely dependent upon such factors as the location of the proposed clinic, the amount of attenuation desired, and the funds available for construction. The same procedure is followed when the matter of obtaining technical equipment is discussed.

This monograph does not pretend to give all the detailed answers needed by one who is interested in this area, but on the planning and organizational level, enough cogent and thought-provoking points are presented to make it a most valuable reference work for anyone whose future plans include the establishing of a hearing clinic.

BOYD V. SHEETS.
University of Utah

TEMPLIN, MILDRED C. *The Development of Reasoning in Children with Normal and Defective Hearing.* Minneapolis: University of Minnesota Press, 1950. Pp. 143. $3.00.

There is an increasing awareness of the need for objective information relative to language development and symbolic behavior. This need is apparent in the study of deaf, aphasic and other 'non-language' children and adults. The problem of language and symbolic behavior, however, prevades all fields of study of the human being. That objective information in this area is so meager can only be regretted. Dr. Templin's monograph on the effect of language retardation and environmental restriction on reasoning is a noteworthy contribution to the literature on linguistic processes.

In this volume the author presents her findings of a comparative study of the development of reasoning in normal and hearing impaired children. The subjects, however, included those restricted by an intrinsic factor (deafness) and those restricted by an extrinsic factor (institutionalization). Findings in this connection reveal that the factor of deafness resulted in lower scores on reasoning tests while the factor of institutionalization showed little effect. This suggests that deafness is a more restricting factor in regard to the development of reasoning than is institutional residence. Institutional residence is 'largely rejected' as a factor in restricting the development of reasoning. This volume has many suggestive conclusions and implications for further research. It should be of special interest to speech pathologists, psychologists, and audiologists.

HELMER R. MYKLEBUST.
Northwestern University

Abstracts

Sobol, I. W. and Wilhelm, H. S. Role of the Rh factor in the etiology of cerebral palsy. *J. Pediat.*, 38, 1951, 447-452.

Ninety-seven cerebral palsied children and their mothers were typed for the Rh factor and the ABO blood groups. Sixteen mothers were found to be Rh negative and in 22 instances there was incompatibility between the patients' AB blood groups and the mothers' serum. In only three children was the cerebral damage caused by kernicterus. The authors conclude that maternal isoimmunization to the Rh factor plays only a slight role in the etiology of cerebral palsy. (*S.J.O.*)

Denhoff, E. and Holden, R. H. The significance of delayed development in the diagnosis of cerebral palsy. *J. Pediat.*, 38, 1951, 452-456.

Records of 100 cases of cerebral palsy were analyzed, the age range being from 6 months to 13 years. Developmental items selected for analysis were: erection of head from prone, reaching for objects, crawling, sitting without support, prehensile grasp, single words, standing alone, walking alone, and two- to three-word sentences. Important deviations were found in the majority of cases as early as three months of age. A possible correlation between the age of onset of 2-3 word sentences and intellectual function is suggested by the data. (*S.J.O.*)

Blum, L., Burgemeister, B. and Lorge, I. Trends in estimating the mental maturity of the cerebral palsied child. *J. except. Child.*, 17, 1951, 174-177.

The authors deplore the fact that intelligence testing of cerebral palsied children too often is done with available tests or with modifications of standard material, rather than with tests constructed especially for the child with cerebral palsy. They mention a few presumably more reliable instruments including the Ammons and Ammons Full-Range Picture Vocabulary Test and a multiple choice form of Benton's Visual Retention Test. A non-language test, the Mental Maturity Scale for the Motor Handicapped, is now in preparation by the authors. (*J.V.F.*)

Harrington, R. Realistic speech training for the cerebral palsied. *West. Speech*, 15, 1951, 10-13.

Speech goals for the cerebral palsied should be within the abilities of the individual. Parents should be encouraged to treat the child as 'normally' as possible, giving early attention to language development. (*C.G.W.*)

Schultz, D. Discussion of three aphasia rehabilitation films. *West. Speech*, 15, 1951, 39-42.

These films were made to add to the knowledge of work done for aphasics by speech therapists. One aim of the series of films was to show that some recovery is possible for the aphasic. The films are available for loan from the Chief of the Presentation Division, Veterans Administration, Washington 25, D. C. (*C.G.W.*)

Tulley, W. J. Late orthodontic treatment in a case of cleft palate. *Dent. Rec.*, 69, 1951, 55-56.

A brief description of the orthodontic procedures used with a 23-year-old patient with 'unilateral harelip, cleft alveolus, hard and soft palates [which] had been repaired by a series of operations before the age of three years.' (*J.M.*)

Abstracts is edited by Eugene T. McDonald, Pennsylvania State College, assisted by the following committee: Jack L. Bangs, University of Washington; Asa J. Berlin, Pennsylvania State College; Leo G. Doerfler, University of Pittsburgh; Charles R. Elliott, Northwestern University; James V. Frick; Lester L. Hale, University of Florida; Jack Matthews, University of Pittsburgh; Sylvia J. Onesti, Children's Medical Center, Boston, Mass.; D. C. Spriestersbach, State University of Iowa; Jesse J. Villarreal, University of Texas; Charlotte G. Wells, University of Missouri. The committee systematically reviews 203 journals for articles of interest to members of ASHA. Students and other members are encouraged to submit abstracts. Directions for preparing abstracts may be obtained from the abstracts editor.

KESSLER, H. E. Speech factors in dentistry. *Oral Hyg.*, 41, 1951, 649-652.

Three dental specialties include speech factors. They are orthodontia, cleft palate rehabilitation in oral surgery or in the making of an obturator, and prosthetics. The author describes the position of the tongue, lips, palate, etc. for various consonants. 'If the general practitioner of dentistry has a good understanding of the tongue placement areas of normal speech, he will be better equipped both for designing partial and full denture cases and for correcting the dentures of patients whose speech is already impaired by the construction of their dentures.' (*J.M.*)

GARLAND, L. H., et al. Nasopharyngeal irradiation. *J. Amer. med. Ass.*, 146, 1951, 454-460.

The authors have reviewed their own results in several hundred cases as well as the results reported in the literature to determine the relative effectiveness of roentgen and radium therapy in the treatment of lymphoid hyperplasia in the nasopharynx that causes deafness and allied auditory disturbances.

Thorough evaluation of treatment is presented as well as a discussion of anatomic and pathologic considerations and symptomatology. (*S.J.O.*)

HUDSON, P. Congenital web of the larynx. *Amer. J. Dis. Child.*, 31, 1951, 447-452.

A case of rare congenital web of the larynx is presented with a brief review of the literature and a description of the embryology. A hypothesis is presented which provides a reasonable explanation for the formation of such an anomaly. (*S.J.O.*)

KLEIN, R. Loss of written language due to dissolution of the phonetic structure of the word in brain abscess. *J. ment. Sci.*, 407, 1951, 328-339.

The article reports a case of loss of ability to read and write as a result of abscess in the right inferior frontal lobe. There was no evidence of intellectual loss. (*J.L.B.*)

WASSIF, K. The anterior process and the ossification of the malleus in mammals. *Science*, 113, 1951, 486-487.

There seems to be a single center of ossification for the malleus in all the species examined by the writer, although the general view has been that the malleus ossifies independently of its anterior process. The anterior process is the sole center. The term 'membraneous center' is applied to it. (A.J.B.)

HEILBRUNN, G. Psychodynamic aspects of epilepsy. *Psychoanal. Quart.*, 19, 1950, 145-157.

The author presents some observations following the analysis of a group of five patients with idiopathic convulsive seizures. He feels that psychiatric factors can adequately account for such convulsive behavior since 'the patients studied could not tolerate any interference with their drives for dependent security and reacted with immediate motor discharge to any such threat, with complete disregard for reality.' (*D.C.S.*)

The April, 1951 issue of the *Hearing News* [19(4), pp. 1-8, 20-22] carries a transcript of a presentation on modern hearing techniques, preschool and elementary levels, held at the Twentieth National Conference of the American Hearing Society, June, 1950, with Miss Alice Streng as moderator. There is a consideration of early diagnosis, hearing aids for young children, programs for nursery school age children, the parents in the training program and the value of 'segregated' schools for the hearing handicapped. (*A.J.B.*)

GLORIG, A. Prevention of deafness. *Hearing News*, 19(5), 1951, 6-8, 18-22.

The causes of deafness are outlined under the headings of congenital (hereditary and toxic) and acquired (brain conditions, general infectious diseases, infections of the ear, physical agents, toxic agents, miscellaneous).

To prevent congenital deafness, the following suggestions are made: (1) for hereditary deafness, no marriage or sterilization; (2) for virus illnesses during pregnancy, prevent illness through immunization or early exposure of mother, with considerations for abortion. The prevention of acquired deafness requires education and treatment leading to the prevention of childhood infectious diseases and secondary otologic infections. Medical removal of obstructions in external ear and lymphoid tissue in the pharynx controls many problems. Acoustic trauma is prevented by reduction of noise by sound treatment and protection against excessive noise levels. Screening tests are needed to catch defects early. (*A.J.B.*)

LEVINE, E. S. Psychoeducational study of children born deaf following maternal rubella in pregnancy. *Amer. J. Dis. Child.*, 81, 1951, 627-636.

This investigation was made by the Lexington School for the Deaf in New York City. It is based on a study of the behavior, intelligence, school achievement, acoustic patterns and general health of a group of 16 children in their first two years of school life.

From the evidence of this study, deaf children with a maternal history of rubella in pregnancy seem to fall into two classes: (1) those who are educable and in whom the major developmental handicap is deafness and (2) those who are uneducable and in whom developmental handicaps are deafness, mental defect, and behaviorisms suggestive of brain damage.

A plea is made to educate the public so that the parents and their children may be protected against this seemingly mild illness. (*S.J.O.*)

BIRCH, J. W. AND MATTHEWS, J. The hearing of mental defectives: its measurement and characteristics. *Amer. J. ment. Def.*, 55, 1951, 384-393.

A total of 274 subjects at Polk State School, Polk, Pa., were given pure tone audiometer tests to determine the incidence and degree of hearing loss in institutionalized mental defectives. The survey was limited to subjects between the ages of 10 and 39 years with a mental age of approximately five years or more. A pure tone sweep technique was used, with signals presented at 15 db above normal threshold. If these signals were not heard, then thresholds of detectability were determined. With this technique, two testers each averaged about 50 individual tests per day, with a range of from six to fourteen tests per hour. The survey showed that 55.5% of this mentally retarded population had a significant hearing loss, while 32.7% had losses large enough to constitute a handicap in the reception of speech. (*J.J.V.*)

LANE, H. AND MACPHERSON, J. Changes in intelligence-test results on retests of deaf children. *J. except. Child.*, 17, 1951, 210-213, 218.

For 17 years, 'Central Institute for the Deaf has been giving mental tests of the performance type to deaf children. A cursory examination of the data on retests, especially after the second retest, seemed to indicate that scores did not agree' with a number of other criteria in that they often seemed spuriously high. So, the test that had been used, the Advanced Performance Scale, was broken down into its component parts and the records of 183 children were examined, all of whom had had at least one retest. The results of this analysis indicated a marked 'carryover' effect from one test to another on some of the items. The recommendation is made that 'if mental tests are made annually, a different performance series should be substituted rather than a retest that utilizes the same battery of tests.' (*J.V.F.*)

KATZ, E. Counselling techniques and standards for the hard of hearing. *Hearing News*, 19(3), 1951, 6-8, 18-22.

This paper, originally presented at the First Institute for Special Workers for the Aural Disabled, explores several aspects of vocational guidance and adjustment for the hard of hearing. The need for rehabilatory assistance such as lipreading, speech correction and hearing aids is emphasized. Discrimination against the hearing handicapped is still evidenced by employers. Vocational counseling should be given by junior high school age, and better training opportunities should be provided. (*A.J.B.*)

BENNETT, S. M. A group test of hearing for six-year-old children. *Brit. J. educ. Psychol.*, 21, 1951, 45-52.

This study investigated the feasibility of using a performance test for detecting defective hearing at the age of six. The subjects were given four sheets of pictures, each sheet containing five rows of four pictures each. The titles of the pictures in each line were phonetically similar to each other. In response to phonograph instructions, the children were asked to underline a given picture in each row.

Five hundred children were tested by the group speech audiometric test and then by the pure tone audiometric test. Fifty-four of the 56 children found to have losses greater than 15 decibels on the pure tone audiometric test had been screened by the group speech audiometric test. The author concludes that, with six-year-old children, the group speech audiometric test is quicker and more reliable than the pure tone audiometric test in attempting to detect a hearing loss. (*D.C.S.*)

News And Announcements

A Conference on Problems of Noise in Industry was held April 23, 1951. It was co-sponsored by the Acoustical Society of America, the American Academy of Ophthalmology and Otolaryngology, and the American Medical Association. Summaries of the papers presented will be published in the *A.M.A. Archives of Industrial Hygiene and Occupational Medicine*.

A summary report on 'Noise in Industry' from the conference at the Tenth Annual Congress on Industrial Health, American Medical Association, is published in the *A.M.A. Archives of Industrial Hygiene and Occupational Medicine*, March, 1951, Vol. 3, pp. 232-235.

The annual Aero Medical Association meeting was held in Denver, May 14-16, 1951. Papers were read by persons from the United States, Canada, North Africa, France and England. Hearing hazards in aircraft maintenance work, the problem of communication in noise and the visual aspects of supersonic flight were three of the medical problems incident to aviation that were discussed at the meeting.

Major Elizabeth Guild and Dr. Juergan Tonndorf, both of the USAF School of Aviation Medicine, Randolph Field, Texas, presented papers on 'Acoustic Trauma in Aircraft Maintenance Workers' and 'Auditory Perception in Noise.'

The Mid-Century Committee for Children and Youth has been organized to carry out the objectives of the White House Conference. The chairman is Leonard W. Mayo, Director of the Society for the Aid of Crippled Children. Elma Phillipson, White House Conference consultant on national organizations, is executive secretary.

The following officers of the Iowa Speech and Hearing Association were elected at the spring meeting: President, Dr. E. C. Fossum, Iowa State Teachers College, Cedar Falls, Iowa; Vice-President, Josephine Simonson, State University of Iowa, Iowa City, Iowa; Secretary-Treasurer, Mrs. Doris Cozzens Boehmler, speech therapist, Cedar Rapids, Iowa; Publications, Oliver M. Skalbeck, Department of Speech, Iowa State Teachers College, Cedar Falls, Iowa.

The third meeting of the Pan American Congress of Oto-Rhino-Laryngology and Broncho-Esophagology will be held in Havana, Cuba, in January, 1952. For information write to Dr. Chevalier L. Jackson, 3401 North Broad St., Philadelphia 40, Pa.

The American Academy of Ophthalmology and Otolaryngology will meet October 14-20, 1951, at the Palmer House, Chicago, Ill.

The fall meeting of the Acoustical Society of America will be held in Chicago, October 22-27, 1951.

Officials of the International Poliomyelitis Congress have announced that the Second International Poliomyelitis Conference has been scheduled for

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News And Announcements is edited by Miriam D. Pauls, Johns Hopkins University.

September 3-7, 1951, at the Medicinsk-Anatomisk Institute of the University of Copenhagen, Denmark. The conference will be jointly sponsored by the Danish National Association for Infantile Paralysis and the National Foundation for Infantile Paralysis.

The sixth world-wide meeting of the International Conference of Social Work will be held in Madras, India in December, 1952. The theme of the Conference will be 'The Role of Social Service in Raising Standards of Living.' The program will stress the social welfare needs and problems of underdeveloped countries, with special emphasis on the Far Eastern region.

In an effort to make it possible for as many Americans as possible to attend the conference in India, the United States Committee is working on plans for group travel to and from India at reduced fares. Persons interested in securing additional information about the 1952 Conference can do so by writing to the headquarters of the I.C.S.W., 22 West Gay Street, Columbus 15, Ohio.

Two associate chiefs of the U. S. Children's Bureau were recently appointed: Katherine Bain, M.D., past director of the Children's Bureau Division of Research, and Melvin A. Glasser, formerly executive director of the Mid-Century White House Conference on Children and Youth. These new positions of associate chief were created to emphasize child research and community services.

The Speech Association of the Eastern States is planning to publish a journal devoted to research and speech education, and to news of the activities in the region. Evelyn Konigsberg is editor of publications. Additional members of the committee on publications include: Andrew Erskine, Sylvia Onesti, David Phillips and Wilbert Pronovost.

Dr. Lionel Crocker, Denison University, has resigned as the first editor of the Central States Speech Association *Journal*. The executive committee has appointed Dr. Paul Moore, Northwestern University, as the new editor.

The *Army Medical Library Classification* is available for purchase. It contains 276 pages, and costs $1.25 per copy. Orders should be addressed to Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Alpha Chi Omega and the National Society for Crippled Children and Adults have awarded six specialized scholarships in cerebral palsy for the current year. These scholarships facilitate graduate training in problems of cerebral palsy for physicians, therapists and educators.

Those receiving scholarships include Mrs. Ruth E. Cook, nursery school teacher in charge of the Nursery School for Cerebral Palsied Children, Phoenix, Ariz.; Frederic Darley, Ph.D., Assistant Professor of Speech at the State University of Iowa, Iowa City, Ia.; Murray M. Halfond, speech pathologist in the Department of Neuropsychiatry, Duke University School of Medicine, Durham, N. C.; Marilyn J. Hill, nursery school teacher at the Meeting Street School, maintained by the Society for Crippled Children and Adults of Rhode Island, Providence; Betty Jane McWilliams, speech therapist on the staff of the Cerebral Palsy School maintained by the Wheeling Society for Crippled Children, Wheeling, W. Va.; and Mrs. Alice S. Noel, education director of the Cerebral

Palsy Pre-School of Vine Hill, Nashville, Tenn.

The cerebral palsy scholarship program is made possible by a financial grant established in 1948 by Alpha Chi Omega which has taken the welfare of the cerebral palsied as its major altruistic project. In the past three years, 54 scholarships have been awarded.

The 1951 Kenfield Memorial Scholarship has been awarded to Miss Margaret Alice Fraser of Upper Darby, Pa., by the Teachers Committee of the American Hearing Society. This award entitles the recipient to take a teachers training course in lipreading from any normal training teacher, school, or university in the United States offering a course that is acceptable to the committee. Miss Fraser is a graduate of the University of Pennsylvania and majored in psychology.

Graduate Assistantships, Fellowships, and Scholarships

This section lists part-time graduate appointments, fellowships, and scholarships specifically designated for graduate work in speech and hearing. General university fellowships and scholarships, unspecified as to area of concentration, and full-time graduate positions will not be included.

Copy should be submitted to the Editor, and should include formal title of appointment, institution, and unit; dates, general duties, and remuneration; name and address of persons receiving applications. Deadline for receiving copy is two months prior to the publication date.

Clinical Assistantships. Purdue University. Speech and Hearing Clinic. Starting February or September. Half-time; 20 hours per week of clinical assistance. $1200 for regular school year; waiver of tuition fees. Student may enroll for 10 semester hours of graduate courses. Address M. D. Steer, Speech and Hearing Clinic, Purdue University, West Lafayette, Indiana.

Clinical Assistantships. University of Illinois. The Speech Clinic, Department of Speech. Starting February or September. Half-time; 20 hours per week of clinical assistance. $1200 for nine months; remission of tuition. Student expected to enroll for three-fourths of normal graduate course load. Address Karl R. Wallace, 138 Lincoln Hall, University of Illinois, Urbana, Illinois.

Clinical Assistantships. University of Southern California. Speech Department. Diagnosis and supervision of cases in the Speech and Hearing Clinic equivalent to 6 or 8 units of work per semester. $80.00 per semester unit of work; free tuition not included. Assistants normally carry 8 to 12 units of study per semester. Address Milton Dickens, Department of Speech, University of Southern California, Los Angeles 7, California.

Clinical and Research Assistantships. Ohio State University. Department of Speech. Starting January, March, June, or September. 15 to 25 hours per week of clinical or research assistance. Two-thirds to three-fourths graduate load. Address W. Hayes Yeager, Chairman, Department of Speech, The Ohio State University, Columbus, Ohio.

Research, Clinical and Technical Assistantships. State University of Iowa. Speech Clinic and Experimental Phonetics Laboratory. Starting September 1. Half-time; 20 hours per week. $720 to $900 for nine months; remission of tuition. Assistants allowed to carry 12 semester hours of course work. Applications for the 1952-53 academic year received until July 1, 1952. Address Wendell Johnson, Speech Clinic, State University of Iowa, Iowa City, Iowa.

Research Assistantships. University of Illinois. The Speech Research Laboratory, Department of Speech. Starting February, June, or September. Half-time; 20 hours per week of laboratory research assistance. $1200 for nine months, or $1465 for eleven months; remission of tuition. Student expected to enroll for three-fourths of normal graduate course load. Address Grant Fairbanks, 321 Illini Hall, University of Illinois, Urbana, Illinois.

Research Assistantships. Purdue University. The Voice Science Laboratory, Department of Speech. Starting February or September. Half-time; 20 hours per week of laboratory research assistance. $1200 for regular school year; waiver of tuition fees. Stu-

dent may enroll for 10 semester hours of graduate courses. Address M. D. Steer, Voice Science Laboratory, Department of Speech, Purdue University, West Lafayette, Indiana.

Teaching Assistantship. Western Reserve University (Granted by the Cleveland Hearing and Speech Center). Winter and Spring Sessions; 9 hours of tuition exemption each session. $500 for five morning sessions weekly, teaching preschool deaf. Address Director of Admissions, Western Reserve University, 11124 Euclid Ave., Cleveland 6, Ohio.

Teaching Assistantships. Purdue University. Department of Speech. Starting February or September. Half-time; 8 hours per week of clinical work and 12 hours teaching duties in required beginning Speech course. $1200 for regular school year; waiver of tuition fees. Student may enroll for 10 semester hours of graduate courses. Address A. H. Monroe, Department of Speech, Purdue University, West Lafayette, Indiana.

Graduate Scholarships. Central Institute for the Deaf. Tuition scholarships for teacher training course in education of the deaf and hard of hearing, and in speech correction. Address Registrar, Central Institute for the Deaf, 818 South Kingshighway, St. Louis 10, Missouri.

Graduate Scholarships. Western Reserve University (Training at the Cleveland Hearing and Speech Center). Remission of full tuition. Applications received immediately. Address Director of Admissions, Western Reserve University, 11124 Euclid Ave., Cleveland 6, Ohio.

Graduate Scholarships. Awarded by the Speech Correction Fund for study at colleges or universities offering training beyond the Master's degree. $500 per year, beginning September or June; applicant must hold the Master's degree, or equivalent, in speech pathology or allied field. Address Mrs. Marceline Jaques, Scholarship Committee, Room 1020, 11 South LaSalle St., Chicago, Ill.

Graduate Scholarship. Kenfield Memorial Scholarship, awarded by the American Hearing Society to prospective teachers of lipreading to the hard of hearing. Available only to college graduates not already teachers of lipreading. Applications must be filed between March 1 and May 1. Address Miss Rose V. Feilbach, 1157 N. Columbus St., Arlington, Va.

Graduate Scholarship. Grants-in-aid awarded by the Audiology Foundation. $500 per year, for students entering into or already engaged in any branch of audiology, including otology, audiometry, speech, acoustics, and the education of the deaf or hard of hearing. Address The Audiology Foundation, 1104 S. Wabash Ave., Chicago 5, Ill.

Working Scholarships. Western Reserve University (Employment at the Cleveland Hearing and Speech Center). Remuneration and working time arranged according to demands for clinical service and needs of student. Address Director of Admissions, Western Reserve University, 11124 Euclid Ave., Cleveland 6, Ohio.

Fellowships. Central Institute for the Deaf. Fellowships in education of the deaf and hard of hearing, speech correction, audiology, acoustics, neuro-physiology, experimental otology. Stipends to be arranged according to background and needs of applicant. Address Registrar, Central Institute for the Deaf, 818 South Kingshighway, St. Louis 10, Missouri.

Fellowships. The Johns Hopkins University. Hearing and Speech Center. Two special fellowships in audiology and speech awarded annually; may be continued at discretion. $3100; no duties beyond satisfactory pursuit of graduate requirements. Applications considered at any time; awards made in June. Address William G. Hardy, Hearing and Speech Center, The Johns Hopkins Hospital, Baltimore 5, Maryland.

Fellowships. University of Wichita (Employment in the Institute of Logopedics). Eight service fellowships; duties primarily clinical. $200 to $250 per month; student is expected to pursue course work toward the M.A. degree. Address Martin F. Palmer, Institute of Logopedics, 2400 Jardine Drive, Wichita 14, Kansas.

Fellowship. State University of Iowa. Fellowship in audiology. Starting September 1. Half-time; 20 hours per week. $1000 for nine months; remission of tuition. Fellows allowed to carry 12 semester hours of course work. Applications for the 1952-53 academic year received until July 1, 1952. Address Wendell Johnson, Speech Clinic, State University of Iowa, Iowa City, Iowa.

Personals

Freeman McConnell, Ph.D., has been appointed Director of the new Audiology Center, Vanderbilt University School of Medicine, Nashville, Tenn. He was formerly at the Institute of Logopedics, Wichita, Kansas.

Edwin Shutts, Ph.D., formerly at the University of Denver, and Claude Hayes, Ph.D., are now Audiologists at the Army Hearing and Speech Rehabilitation Center, Forest Glen, Walter Reed Hospital.

Mrs. Marjorie Bearss has been appointed Instructor in Speech Therapy, Southeast Missouri State College.

Loyal Bearss has been appointed Assistant Professor and Acting Director of the Speech and Hearing Clinic of the University of Mississippi.

Carolyn Widener has accepted a position as speech therapist in the Indianapolis Public Schools.

Robert Meyer, formerly of the clinic staff at Purdue University, has been appointed a member of a speech and hearing test-team, Nashville, Tennessee.

John Paquette has been appointed Supervisor of the Purdue Public School Traveling Hearing Test Service.

Mrs. Rena Levy, New York City, received the Women's Research Guild's annual 'Women Of The Year' award. The Women's Research Guild is an independent national organization of women in the fields of science, religion, social work and education. Mrs. Levy is a speech correctionist in New York City.

Keron Caldwell Morrical, Professor of Electrical Engineering at Washington University and Research Associate at Central Institute for the Deaf, died suddenly at his home in Clayton, Missouri, on June 2, 1951.

Dr. Morrical, 43, received his undergraduate degree and Ph.D. in Physics from the University of Illinois. He went to St. Louis in 1947 to set up a joint program in acoustics between Washington University and Central Institute for the Deaf. From 1936 to 1942 Dr. Morrical was a member of the advanced acoustics development section for the R.C.A.-Victor Division of Radio Corporation of America. From 1942 to 1944 he was on leave to Harvard University where he worked on experiments at the University's underwater sound laboratory. He received the Naval Ordnance Development Award for his contributions at Harvard.

Dr. Morrical was chairman of the standards committee of the Acoustical Society of America, consultant to the committee on audiometers and hearing aids of the Council of Physical Medicine and Rehabilitation of the American Medical Association, and section committee vice-chairman of the American Standards Association.

Dr Morrical was primarily responsible for the design of the acoustical and mechanical features of the new research and clinic building at Central Institute for the Deaf. Fortunately, he experienced the pleasure and pride of occupying his new laboratory for about two months prior to his death. His persevering insistence on high standards of electro-acoustic measurements and his thoroughgoing scientific honesty made him a valuable member of the various standards committees on which he served. His laboratory colleagues and his graduate students were always stimulated by his keen analytic judgment.

Dr. Morrical presented his first paper to ASHA at the 1950 meeting in Columbus. Our field has lost a disciplined and creative thinker, but he left a good heritage to his young assistants from whom we shall hear in the not too distant future.

Harry P. Wareham, Executive Vice-President of the American Hearing Society since 1946, died June 11, 1951. This widely known philanthropic executive was the originator of the term 'Community Chest,' and organizer of the first municipal campaign of this type in Rochester, New York, in 1919. In his promotion of the objectives of the American Hearing Society, two accomplishments merit particular attention: the new name, and direct support from Community Chest.